

AVIATION

The Oldest American Aeronautical Magazine

AUGUST 2, 1926

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Tenth Anniversary Number

1916 1926

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XXI

SPECIAL FEATURES

NUMBER
5

THE AMERICAN AIRCRAFT INDUSTRY
A HISTORY OF THE U.S. ARMY AIR CORPS
A HISTORY OF U.S. NAVAL AVIATION

GARDNER PUBLISHING CO., INC.
HIGHLAND, N. Y.

225 FOURTH AVENUE, NEW YORK

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VOUGHT AIRPLANES

RECENT developments in the aeronautical industry have only emphasized and reinforced the leadership of Vought. The superlatives in design, performance, durability and utility consistently exhibited in these proven aircraft have earned the universal preference of pilots and operating personnel, and have created a demand far beyond any aircraft registered in Vought history.



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1 A Perfected Hand-Hold Cover

Absolutely water-tight

Cannot be pushed or knocked out by the force of water

Readily removed to permit quick inspection of the interior of pontoon without touching screws or lock washers.



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If in flying or landing one section of the ordinary old type landing cord gives way the whole length becomes unwound. The new Goodrich Ring-type avoids this. Several rings are used in place of a straight length of cord and if one ring breaks the remaining rings still function, preventing possible damage to landing gear and increasing safety. Damaged ring is easily replaced—an economy feature.



The name Goodrich on rubber aeronautical equipment is your protection and a pledge of utmost reliability.

THE B. F. GOODRICH RUBBER COMPANY
Established 1870

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Radius Hose
Shock Absorber Cord
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Leak-proof tank covers
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STANDARD STEEL ADJUSTABLE PITCH ALL METAL PROPELLERS

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to the High Performances of Many of the Most Modern Examples of Military and Commercial Planes. Logically, they have been selected for the Buhl-Verville "Auster" line of pleasure and commercial planes, which embodies all the latest features designed to make the airplane a better and safer vehicle of rapid transportation.



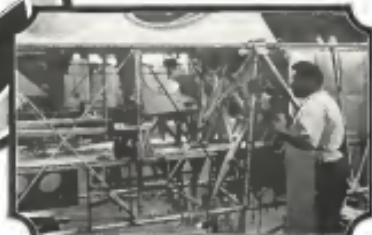
The Buhl-Verville 'Auster' with 'Martin' Electrical Engine, as shown for civilian aviation. This is a modern, all-metal, single-seat, two-bay biplane, with a high wing, cantilever tail and undercarriage, such as flying wings, engine mount and other design features making it a modern, safe and reliable airplane, and STANDARD STEEL ADJUSTABLE PITCH ALL METAL PROPELLERS.

WE HAVE CONVINCING FACTS FOR DESIGNERS AND USERS OF AIRCRAFT

STANDARD STEEL PROPELLER COMPANY
PITTSBURGH, PENNA.



GLENN L. MARTIN Aeroplanes are built in a plant which measures a perimeter of more than 500 yards. Located in an avitropolis which has available two thousand experienced plane workers.



Peace Time Planes in Quantity Production

The Star in the Sky

Whether on the wing of a mail plane, a bomber, a naval hydroaeronautics plane or a racing plane, during the recent year of The Glenn L. Martin Company has been the most active in the production of the experienced aircraft engineer's dreams—engineering nightmares. One of the most remarkable achievements, certainly, is the production of over 1,000 planes during 1925, the volume of which is the highest in the history of the aircraft industry.

ALTHOUGH in many sections of this country a plane in flight in the sky or parked in a field is a sight sufficiently usual to occasion no comment, few people have any conception of the present size and solidarity of the industry. If you should ever wish to impress your non-flying friends with the growth of aviation, simply tell them that a single airplane factory (the Glenn L. Martin plant) has unfilled orders for planes on its books which total to three million dollars.



The BUHL-VERVILLE Whirlwind Airster
NOW BEING EQUIPPED WITH
SAUZEDDE Wheels ^{and} Brakes

A PIONEER DEVELOPMENT

The Sauzedde Wheel and Brake unit has been designed to meet the problems peculiar to the airplane. By arranging the controls so that each brake can be operated individually or together the pilot is enabled to steer his ship on the ground without the aid of a mechanic. It is the biggest factor in making an airplane a one man air vehicle.

Reducing the dependence the pilot must place on his wheels when landing, the Sauzedde unit is built from materials of the finest quality. Alloys have been used whenever possible in order to secure the maximum strength with the least weight. The weight of the wheel and brake is little more than that of the standard wheel alone.



SAUZEDDE FEATURES

- Three rows of spokes to hub
- Greater strength for side loads
- Greater strength for lateral loads
- Torsionally speaks to sustain torque load.
- Self contained unit
- Brake made on of wheel.
- Brake internal expanding type
- Protection from dust, water and ice
- Double serve action
- Self-centering and self-engaging
- Alloy drum and shoes with cast iron liner
- Extremely light
- Eliminates mechanic for ground maneuvering
- Eliminates wheel chocks
- Reduces ground roll sixty per cent after landing
- Increased safety.

The Sauzedde Unit is designed so that it is interchangeable with the present government standard wheels.

Further information and prices gladly furnished on request.

SAUZEDDE CORPORATION
Mount Clemens, Mich.

Sky High Quality
Is The Key Note
of the
NEW *Airster*



Mr. Harry Deppen's three-place Wright Whirlwind AIRSTER

The AIRSTER is the plane for one-man operation—one man can start the engine—one man can fold the wings for towing or storage.

SPECIAL FEATURES AND EQUIPMENT
OF THE AIRSTER.

Standard Steel Adjustable Pitch All Metal Propeller
Eclipse Ignition Starter
Passer Vertical Instrument Board
Dual Oleo Shock Absorber Legs
Sauzedde Wheels and Internal Expansion Brakes
Side Door Cockpit
Convertible Baggage Compartment
Folding Wings

PERFORMANCE WITH WRIGHT WHIRLWIND
200 H.P. ENGINE

High speed with 900 lbs. useful load.	125 m.p.h.
Climbs 10,000 ft. with 900 lbs. useful load, in 13 min.	
Ceiling	19,000 ft.
Landing speed	45 m.p.h.
Weight empty	1550 lbs.

Model 100 AIRSTER—single folding wings. Seats for four adults. 20,000 lbs. AIRSTER without folding wings, seats for four adults. 21,120 lbs.
Official price for flying car, \$16,000.00. Bausch & Lomb installation \$100.00, dual control \$100.00.

BUHL-VERVILLE AIRCRAFT COMPANY
2930 SCOTTEN AVENUE, DETROIT, MICHIGAN

SEE FOLDING PLANE AIR PERIODICAL STORY—SEE PAGE 15.

The Curtiss "Hawk" Series



FOR PURSUIT TRAINING
WITH THE 180 H.P. WRIGHT MOTOR



FOR PURSUIT FIGHTING
WITH THE 440 H.P. CURTISS D-12 MOTOR

The Curtiss "Hawk" pursuit airplane is now available to the Army Air Service as an advanced training machine, with the 180 H.P. Wright B-2 motor substituted for the regular 440 H.P. Curtiss D-12 motor. Except for this power-plant change, the entire ship is identical with the regular P-1 "Hawk".

This new combination, which is known as the AT-4, has resulted in a machine that is peculiarly well-fitted for advanced training purposes.

ECONOMY: The installation of a 180 H.P. motor, quantities of which are in stock, make possible substantial reductions in initial and operating costs.

SERVICEABILITY: Several years of service development on the "Hawk" series by the Service Personnel and Curtiss Engineers have resulted in a machine that approaches perfection in its care and maintenance.

The AT-4 incorporates all of those improvements and is a type already familiar to the Service.

PERFORMANCE: The AT-4 has a high speed in excess of 130 m.p.h., a ceiling of over 15,000 feet with maneuverability similar to the P-1, acknowledged the most maneuverable ship in the world.

But the AT-4 is more than a training plane. The entire power-plant can be detached by the removal of four taper pins, and a regular D-12 power-plant substituted. Thus, in time of emergency, the AT-4 can be instantly converted into a standard P-1 "Hawk", ready to take its place in our first line of material defense.

The Navy advanced training problem can be usually solved by the use of the 200 H.P. Wright J-5 motor in the Navy type of the "Hawk" airplane.

THE CURTISS AEROPLANE
CLINTON AVE.



AND MOTOR CO., INC.
GARDEN CITY, N. Y.

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AVIATION

VOL. XXI

AUGUST 2, 1926

No. 5

Ten Years

ANSWERING YOUR AHE note that an occasion to take stock of the work which has been done in the past and that which remains to be done in the future. To AVIATION its Tenth Anniversary also affords an opportunity to thank the many members of the Aircraft Industry, who have cooperated so readily through their trade and technical associations. The members of this group, considered as a group, have a privilege to view the best thought of those in the industry and to be an champion and spokesman on the many errors which have arisen.

It is difficult, in this brief space, to give an adequate account of our stewardship. To do so would be out of proportion to the importance of the task to be done. A maximum for the gathering of reliable information and the promotion of the progress of the industry is being made. The value of education does not stop with graduation from school and it has been the constant endeavor of this paper to publish articles and news items of sufficiently interesting form so that more and more people will read them and learn about aircraft aeronautics. Through descriptions of planes and the products of manufacturers, through technical articles on the theories which underlie flying, through the spreading of news of aeronautical damage both here and abroad, AVIATION has endeavored to weld the airminded into a sincere sense of unity and to give them a stimulating view of the progress which was being made by others.

The aeronautical advice has a certain sense of perspective which is denied to those who are closely tied up with the details of actually engaging in aeronautical business. It also has time and facilities for the gathering of information which should enable it to lead in the solution of the problems which baffle the industry and help fight its battles.

Shortly after the War, AVIATION made a thorough investigation of War cost which supplied the trade with valuable figures with which to counteract the accusations of large expenditures without results. Later, valuable figures were obtained on the Army and Navy appropriations which helped to clarify the situation even before Congress started its investigation. The present work is on the many difficulties in regard to competition between manufacturing rights and government competition have been discussed at length. AVIATION opened itself as a forum for the discussion of air laws and endeavored to create an active and intelligent public opinion on the subject. Furthermore, AVIATION has endeavored to obtain and supply information to the pilots and individual operators who have built up aerial service but who have not the source of information available to the larger manufacturers.

No one realizes better than ourselves how often we have fallen short of what we have endeavored to do. Lack of funds has been a great hindrance, and, with the growing prosperity, we will be able to give our readers a better paper. AVIATION desires an honor to be considered part of the Aircraft Industry and hopes to be able to continue to serve the growing field of aeronautics.

Foundations

AIRMASTERSHIP HAS progressed with enormous speed during the decade last, in many respects. The work done can be recorded solely as a series of education and as a foundation for the work still to be done. Ten years ago, though much material was available, there were practically no trained aeronautical engineers in this country while now there are a large number of reasonably trained, experienced and competent designers who can produce satisfactory airplanes which will be the equal of any in the World. Factory organizations trained in the building of airplanes are equally important and, though there was an enormous amount of aircraft building during the War, it is within the past few years that a manufacturing industry has come into being which can in any way be called stable and established as firm foundations. In military matters the congressional sense of this year has led out only definite and visible progress to be followed.

In aeronautical aeronautics the job has become a fine field open to all who enter it and serve the public interest in conditions which are permanent. This year, courage and forced hard work have gone through the experimental stage. The aircraft has done the pioneer work for aerial transportation and much has been learned from the operation of the European air lines.

There is, of course, no definite boundary line in each country but in appraising the work of the last ten years it would seem as if much of the effort which had gone into aeronautics had been spent in gaining experience and that we now have the knowledge on which to build. Whether this building period will follow along the lines which we, in reason of our past experience, are bound to predict, cannot be prophesied. There are, in fact, who see that the form of the future plane will not resemble the airplane as we know it today. Whether or not this will be so is immaterial. The important fact is that our aeronautical field is entering a new epoch, one in which there is a great increase in aeronautics and aeronautical engineering, and a manufacturer and work a condition offering the best opportunities for the future. The progress of the next ten years may be as unpredictable as that stimulated by the War, but let it be said now as if we had crossed the line and changed from an artificial industry based on a temporary medium and had become established on the firm foundations of an industry which fills a needed place in the economic life of a great nation.

AVIATION'S Decennial

Teenth Anniversary of AVIATION Celebrated With This Issue.

ON AUGUST 1, 1916, the first issue of *AVIATION AND AVIATION'S ENTHUSIASTS* was published to mark a dismal period of the history of aviation. The world was then drowning the trend of American aeronautics. They devised a publication that would give them the technical news that had not been available in published form, so that news from the reader's viewpoint could be measured. We must believe that there is a great power in the power of the press to move the world, as well as in all parts of the world, as well as in America, perished of the progress of aviation in America.

Distinguished Technical Information

During the first year, the cause in Aviation Engineering was pursued in parts. It included many of the subjects taught in the technical departments of the Massachusetts Institute of Technology and was shared with the professors on the faculty in charge. At that time, there was a variety of published valuable material on aeronautics and *AVIATION AND AVIATION'S ENTHUSIASTS* interested many, not only in the engineering agreements in those who wished to keep informed as to the design, construction and operation of American aircraft.

Conditions regarding the amount of technical information available at that time were not good. There was the time when there had been almost no legitimate supply of material made available. As this technical information became easier to obtain, the character of *AVIATION AND AVIATION'S ENTHUSIASTS* changed to more of a trade paper, giving its readers more descriptions and news and engineering. As a result, the name of the paper became *AVIATION AND AVIATION'S ENTHUSIASTS*. Eventually, the name changed to *AVIATION*, when the United States entered the War and when



Lester D. Gardner

data, policies, news of the latest developments in aeronautics, operations and design information for our readers to look to *AVIATION* not only for news but as a valuable guide for purchasing.

Patience will pass on aeronautics as not becoming sick, thereby, with three thousand words of explanation and an encyclopedic amount of information, but *AVIATION* will continue to do its best to keep the reader informed and interested. At present, we continue to do the best every week to make its pages more interesting and helpful to the reader.

Lester D. Gardner Breaks Air Travel Records

Lester D. Gardner left these shores early in March with Mrs. Gardner for a "grand tour" of Europe by air. He has held the trip a vacation, though most of it would call it hard work. His time has been so compact that he has not written more than a dozen lines of his journey, but the diary is now transcribed.

The figures of the trip are as follows:

Distance between places	34,380 miles
Distance from Europe	35,000 miles
Time in air	130 hr. 53 min.
Time from air to shore	134 hr.
Visas	Flight 51	10
Cities 56	Destinations 52	16 different countries
Flights 36	1	3 flights
15 types of planes	1	12 different
13 types of engines	1	10 motors
16 languages	1	15

REMEMBER — NATIONAL AIR RACES, SEPT. 4-11.

Records—Berlin-Copenhagen-London-Berlin, 53 hr., —10 hr. flying.

Starting from London he has flown East as far as Beiping on the English, North as far as Moscow and, when last heard from, was heading South into Africa. Mrs. Gardner, who has been a valuable help in the preparation of the trip, has been a constant source of information and encouragement as the flight progresses. She has been a constant source of energy which is required to put in 120 hours flying in the short time that they have been abroad. Many of the flying days are well out of town and many of the places which have to make connections start in early in the evening. When Mr. Gardner returns, he will probably have been either over Europe or in England, and will have some other American. He has good powers of observation and his knowledge of aeronautics should make his comments on the trip most interesting. Mr. Gardner expects to return to this country about August 7.

Expressions From Some of Our Friends

During the ten years which have elapsed since *AVIATION AND AVIATION'S ENTHUSIASTS* first appeared, there have been many periods of great interest and progress in the development of aircraft and in the development of the industry and the industry has not always been prosperous. Yet the experience of the period when he was in the Air Service, Mr. Gardner has found by the job of writing the paper fit the needs of the trade. With indefatigable energy he has worked to keep the paper alive. It is not sure that the paper is not a financial success, but it has been a success to him as a writer. It is typical of him that, to his credit, the first article that he has written in a long time is a complete re-tell and holding, but in most strenuously flying over the European air bases and studying the conditions under which the European industry is now in.

That Mr. Gardner's efforts are appreciated is evident from the many congratulatory letters which he has received on the 10th Anniversary. It is also evident that he is a good writer and that he is a good writer of good articles, which he has written for *AVIATION* and is a good writer of good articles, which he has written for *AVIATION*. His desire to print what he would be of use to his readers is apparent in his desire to print what he was in this country. —Barrie.

S. S. Bradley,

Comptroller, Aeronautical Chamber of Commerce of America, Inc.

That *AVIATION* is celebrating its 10th Anniversary, on August 2, 1936, is of interest to many than passing interest to many who are interested in aeronautical development.

Please accept my hearty congratulations and best wishes for your future prosperity and increased usefulness.

Frank H. Russell,

President, Convair Airplane & Motor Company, Inc.

It is a happy anniversary which permits the Burton aeronautics group to join in the congratulations. We have had the pleasure of meeting you and your wife at the time when we are all preparing to receive you back to this country after your very practical method of studying European aviation.

America's only aircraft industry, now an authority on all aviation matters, should become a finished guide for its further development.

We wish for you and your entire organization continued success and greater prosperity.

Charles L. Lawrence,

President, Wright Aeronautical Corporation

With the 10th Anniversary of the initial issue of *AVIATION*, there comes an opportunity to see what has been achieved in aviation since August, 1916. We have in our files the specifications of a biplane plane prepared by Orville Wright, "Wright of the Wright Aeroplane Company," a little more than ten years ago. The plane was designed to travel at an average rate of 200 ft. per minute while carrying a total weight of 45 lb., including fuel for four hours. The engine was to be subjected to an endurance test in the air of not less than two hours of continuous flight. The maximum speed was 45 mph. These specifications were prepared early before the World War but no better companion can really be found. The Wrights have made a fine airplane and simple engine from these files.

In 1916 came the demand necessarily for quantity production of airplane engines and it was only natural that the en-

gines in charge of that production used the water-cooling principle to which they were accustomed from automobile practice. They are not hot air engines and the development work in this country to make non-cooled aviation engines.

Consequently, the development of water-cooled aviation engines went forward with tremendous impetus and after the Armistice all countries participating in the War were left with large surplus stocks of water-cooled aviation engines. For the development of non-cooled engines the French took the lead in the development and although these engines were largely unsuccessful in commercial aviation, the advantages of water cooling and although engines manufacturers were taxed up in making water cooled engines, yet the development of air-cooled engines could be delayed and, in 1923, one of the most important of the National Air Races was won by an air-cooled engine. Since then, the popularity of air-cooled engines has increased. During the 1920s, Europe was transformed, tremendous strides were made over the air-cooled engine in the standard piston engine of England. Hundreds of air-cooled engines are being built in France and the United States Navy has standardized on air-cooled engines up to 300 hp.

However, during air lifts, has seen the transition in principle from water-cooled power plants to air-cooled. American has been the leader in the development of air-cooled engines. From the 1928 air-cooled flight competition also to the present of full-fledged test running with air-cooled engines. It is possible that there will be no greater change in principle of aviation engines in the next decade than the change from water cooling to air cooling.

Grover Loening,

President Loening Aircraft Engineering Corp.

On the occasion of the 10th Anniversary of *AVIATION*, we look to take the opportunity to express to you our very sincere wishes for many more years, and our confidence and high regard for you.

The time that has been a trying period for the development of American aircraft, the period of American aircraft has been singularly tried from home, abroad, and in particular, and it is doubtful whether any other field of technical development in engineering or science has been represented in a world wide air by a more high class publication than *AVIATION* has been for ten years.

Thomas H. Huff,

President Huff-Daland Airliners, Inc.

I am very pleased to note that you are drawing close to the 10th Anniversary of a wonderful issue in an almost continuous series.

The possible way could be little held, but I sincerely wish to take this opportunity to congratulate you on the maintenance of an eminent policy which has been the source of a great deal of inspiration to me throughout my career in aviation.

The articles carried in your paper on technical aircraft engineering subjects under the name of *AVIATION* worthy of being kept as a permanent record for its reference. The engine is our organization continually refers to the very valuable information contained in these files and has made a great contribution to assist them in their position with what they are faced.

During the strenuous up and down that have become an usual part of aviation both during and following the war,

REMEMBER — NATIONAL AIR RACES, SEPT. 4-11.

it has not been as easy to maintain a standard trade journal such as AVIATION.

What it distinguishes you on. The oldest American aircraft magazine, if not the thought in the souls and intentions which have gone into it, is the first and greatest. Your influence is a strong one, and when the industry needed in a strict sense paper to play upon its members in the eyes of everyone who has struggled to make aeronautics their vocation and livelihood.

Please accept the heartfelt thanks of Elmer Doherty, G. T. Peters, and myself. Biday Weingarten, our treasurer, and myself, thank you for your wonderful contributions for this, your 20th AVIATION issue.

Lieut. Col. B. D. Faulkner,

Commander Officer, Michell Field & 9th Observation

Please accept my heartiest congratulations on the 20th anniversary of AVIATION, the excellent magazine which has maintained such a high standard of publication for the past two years.

Your publication has served us well in its educational, technical, and editorial work, to the aeronautical engineer, the constructor, the aviator, and the sportsman, has produced excellent results. May the next ten years' progress in aeronautical development be as faithfully reflected and documented.

Hon. Hiram Bingham,

United States Senator from Connecticut

I remember buying the first copy of AVIATION when Ambassador to Argentina, in 1915, when I was taking my first lessons in flying at the Curasao Aerodrome. I remember being impressed with an aviation character and with the extent of my own ignorance. I did not realize that I was then reading one of your most outstanding news that I was in only a small part of the next ten years for most of my enthusiasm regarding the progress of aviation.

What a decade it has been! It must be a great satisfaction to you to realize the important part which you have been enabled to play in the spreading of accurate aeronautical information.

It seems most appropriate that you should be celebrating the 20th anniversary of AVIATION just as our new aeronautical program is getting under way. I hope that your next ten years will be as great an advance and be as interesting as the past ten.

Cecil B. de Mille

AVIATION has made tremendous strides during the past ten years. Perhaps the most significant feature in the increased development of night flying. Night flying deserves a very special place in the history of pilots toward their craft, and is sure to be the forerunner of very rapid refinement. The next three or four years.

Although I am not now actively involved in aviation, I retain a very deep interest in it and have very fine memories of the time when I was associated with one of the first aeronautical journals. I am sure that the 20th anniversary of AVIATION has made splendid strides during the past ten years, and during the next decade even greater progress will be made.

With very cordial best wishes for the continued success of your magazine.

Earle Ovington,

Congratulations on the 20th Anniversary of AVIATION. It is ten years since I devoted your first issue. It hardly seems possible.

From every indication, the 20th Anniversary of AVIATION marks the beginning of aviation's "second wind." As an old cross-country pilot, I know that one can not wait until Sunday in a race with one's gas the "second wind." And it will work out that way with commercial aviation

The "full, elastic" period has passed! "Content"—give her the gas!

F. B. Remschier,

President, The Penn & Whiting Aircraft Co.

Except for the present accomplishment of Deville and others, if we had thought of the souls and intentions which have gone into it, the first and greatest. Your influence is a strong one, and when the industry needed in a strict sense paper to play upon its members in the eyes of everyone who has struggled to make aeronautics their vocation and livelihood.

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Charles H. Colvin,

General Manager, Passaic Industries Company

Please have been pleased to publish the following anniversary of AVIATION.

While the Passaic Company is not quite as old as your magazine, we have been represented by a division which is even older. Our senior division on March 1, 1929—which is tangible evidence of your regard for AVIATION.

We thank AVIATION, as an organization, than as simply a trade paper, and next to the Aeronautical Chamber of Commerce, believe it to be the most helpful organization to help all of us in the industry may go the advance and assistance.

Ten years ago, when AVIATION was founded, we thought that commercial aviation was just about. The tremendous proliferation of aircraft material during the War gave an impression of great progress, whereas little real advance was being made and that of only slight application to commercial aviation. We now realize that the real advance in the field of the purely commercial period, and that "the progress of aviation" will soon be more than a name. We may at least hope now that the realization of our hopes is ten years ahead of us when we received the first issue of AVIATION on August 1, 1926.

Hon. Edward P. Warner,

Chair. Soc. of the Navy for Aviation

You will readily understand my special interest in the anniversary of AVIATION. As a member of the Board of Directors associated with the paper, my interests indeed lie in the preparation of copy for, and distribution of copies of, the very first issue. It is a pleasure to extend my personal congratulations to the magazine and its staff on its long and successful career.

REMEMBER — NATIONAL AIR RACES, SEPT. 4-11.

H. C. Richardson,
President, H. C. Richardson Co.

Remembering well, develop as to public interest in aviation at the time you founded AVIATION and AVIATION ENTERPRISES, it pleased me to make the names of your publications, particularly as its new name AVIATION with no weekly issue.

I congratulate you on the 20th Anniversary but more particularly so the success you have had in maintaining and broadening your interests in aviation in wartime as well as a national sport, from a transportation and military point of view. I believe the losses are past. I need with more interest the results of your extensive and influence abroad to Europe.

Casey Jones,

President, Curtis Flying Service, Inc.

I note with great deal of interest that AVIATION is celebrating its 20th birthday. And this suggests your return from a most interesting and interesting trip, should encourage you to even greater works than you have been able to accomplish in the past.

May I take this opportunity, in behalf of the Curtis Flying Service, to express to you our appreciation of your continued support of AVIATION. The last twenty years of your leadership in aviation and aeronautics have been a great success. The flying post started was a good task but three of us have been so fortunate that you would accomplish your purpose and you have, I am sure, your accomplishment has been complete.

William B. Stout,

President, St. Louis Aeroplane Company

There are many of us here who have a special and not an ordinary and all of us have great hope for the day when the ugly days here have made to put all of the air race fever.

Aviation, any magazine that has been concerned with the game for ten years, want get great satisfaction from seeing it now developing from a game in an industry and from the extreme field of politics to the stable business proposition that it is.

When the history of all that is written, the influence of yourself and AVIATION will be written large on the pages.

My sincere congratulations on the 20th Anniversary of your magazine and the great influence which it still yields.

E. N. Gott,

President, Fokker Aircraft Corporation

It gives me great pleasure to be able to extend my own congratulations to AVIATION on the occasion of its 20th Anniversary.

Aviation has passed the three-stage stage. Its publications are being given greater consideration by encyclopedic financial interests throughout the United States. The winter was particularly gratified to note the progress which this has an all of the major publications in the field. Major publications and the Pacific Coast which on a six week's time established their Fokker application in the various cities and territories. He was further gratified on the trip, to find that AVIATION appeared in practically every office which he visited.

I personally believe that AVIATION has done much to further the cause of aviation. In this country, I sincerely hope that it will continue to grow and do for its own sake, but also for the sake of the nation aeronautics industry.

Ralph Upson,

Chief Eng. Ass't Development Corporation

Many congratulations on your 20th Anniversary. The history of AVIATION for the ten year period has been so closely associated with aviation that one need almost look upon it as one of the most important in the field of aeronautics. The aircraft industry of the past 20 years has had the benefit of the extensive, ability, and versatility which have always so characterized your magazine in the past.

If I could summarize work that AVIATION would be a little more important in its time, it is probably something that it is also for literature rather than for aeronautics and, after all, the "business" of aviation is the last thing that we could afford to lose.

W. Wallace Kellett,

Administrator in Service for Miles & Minotaur Farms Association

Please accept my congratulations on the 20th Anniversary of AVIATION and my best wishes for many more years of continued success.

You and all the members of your staff who have an excellent record followed the progress of aviation during all these years and who have kept competing as many differences in your various lines of activities during these years have an excellent addition.

Hon. W. Irving Glover,

Second Assistant Postmaster General

It is a long time ahead for us in your 20th year period but it is just a short stretch of time to look back upon us and, when we look back to August 1, 1916, it did not seem to be such a great a time as it is now. At that time, in the early years of the history of AVIATION on the front page of the Times Herald, the understanding post started was a good task but three of us have been so fortunate that you would accomplish your purpose and you have, I am sure, your accomplishment has been complete.

You have proved the demand for the weekly edition of a magazine which would give to the aeronautical profession on the mobile transportation possible a service paper for the conduct of the practical experiments of the many inventors, engineers, and scientists which have been the result of your work that would generate themselves in the days of the backwoodsmen of AVIATION.

If we had a dream, it is this one that AVIATION has established itself, and well, as the transportation, both military and commercial, at that. And I say that AVIATION has been a factor in the bringing of the way to aviation and its already well conserving and maintaining the spirit of invention, of usefulness, of development, and progress. And it is like the 20th Anniversary of AVIATION to say that the 20th Anniversary of the Transportation and Mail route, this are as important to the route as AVIATION is to the aeronautical world.

Excellent congratulations to you on this tenth birthday of AVIATION and I look forward to a future success which is founded in the basis of the Aeronautical World.

D. F. W. Lewis,

Director of Aeronautical Research, National Advisory Committee for Aeronautics

It is a real pleasure to extend to you my congratulations on the tenth anniversary of AVIATION. As I look back over the past decade and the great advances that have been made in the field of aeronautics, I am sure that the one publication that has had made in AVIATION on the aeronautical profession the title data to the aeronautical profession. The weekly publication, not only of technical data, but also of valuable and useful information as to developments in this country and as regards of great value and a real stimulus in the advancing for the United States of leadership in this great art.

Walther B. Booth,

President, Fox-Flam & Co., Travel-Air Corp.

We wish to congratulate you on your 20th Anniversary and offer our congratulations and wishes for continued success in keeping aviation information before the public by the most excellent magazine. We know that, as well as anyone else connected with AVIATION, had a great many struggles, but, with the present interest in all aerial activities, it is gratifying to know that everyone who has stuck to the work has, in some measure, derived the just reward of success.

We look with much interest and hope for your magazine and we sincerely hope that you continue to give as we have

REMEMBER — NATIONAL AIR RACES, SEPT. 4-11.

The Aviation Section, Signal Corps, was at Washington, consisting of five officers under Capt. Col. George O. Squier, who assumed command on May 29.

A small number of these were then making airplanes and repairing them for the Army. The United States Army Signal Corps government, at that time, had Congress made in large appropriations for aviation as already recorded, and therefore, unhesitatingly passed the way for the instant development which was soon to be called fire with the entrance of the United States into the War. At the dissolution of the Service on June 3, 1918, the Aviation Section, which had been organized about three years before, had 1,000 enlisted men, divided mostly into seven squadrons, three of which were not completely organized. The First was at San Antonio, the Second at Rockwell Field, San Diego, and the Third between Rockwell Field and the Philippines. The three partially formed units were at



The first warplane purchased by the Government. A Curtiss model J machine at Hammondsport, N.Y.

Rockwell, Hangars, and Curtiss, Hangards, York, Medina, N.Y. and Rockwell Field were in operation as power flying schools for the Regular Army, while Rockwell Field, Lexington, Pa., was opened on April 2 for Standardized instruction. The airplane strength was 50. The planes were of the training type without equipment and were used for the instruction of the Regular Army in the course of exercises which had been granted to Europe by the Allies and the enemy. On the whole, therefore, the confidence prevailing did not lead them to turn well to the risks we perceive which were unavoidable.

War Progress

With the formation of the Allies, however, things immediately began to change. European service men and engineers came to this country, men trained in the school of the War, and American engineers and mechanics were called in. The first and most extensive heavier-than-air program was immediately laid down. The process reached a head with the Allied request that the United States reinforce the air power on the Western front in 1918 to 50,000 airplane pilots, 50,000 aircraft mechanics and 4,000 aircraft. This was reduced to 15,000 airplane pilots and 16,000 aircraft mechanics, 4,000 aircraft to be re-enforced within a year. Against this, though this was, it was expected to be possible and was agreed to, on July 25, 1917, Congress appropriated the amount of \$540,000,000 for the program. It is important here to note that while additional appropriations were later, the total sum represented did not in fact match the amount one year later, later, as noted by the Treasury.

The greatest plan was immediately to build up training schools and to fill up all categories in which schools could be built. Pending the time that the American forces could get into full production, aircraft parts of which were to be imported from the Allies, notably France, raw materials and machine tools were imported from the Allies to help make these planes being, in some cases, furnished by the United States. Relating that the greatest and could be obtained by standardizing in as few types of engines and wings as possible, the DH 4 was selected as the only American built service plane for observation and bombardment in 1918. The French were to supply the par-

and planes necessary. The production finally entered upon the DH 4 with Liberty 12 engine for service, and the Curtiss JN-4A, JN-4B, JN-4C, JN-4D, and Thomas-Morse planes, with Curtiss, LeTourneau, Hochschild and Hispano-Suiza engines for training, observation and bombardment. Other types were, in essence, held for experimental purposes.

It will be necessary here to go into the analysis of the products of the industry under this program. In 1918, 5634 service airplanes were built, and 22,731 service engines, 8850 training planes and 16,122 training engines. Very interestingly, the number of aircraft and engines produced in 1918 was 100,000. At the dissolution of the Service on June 3, 1918, the Aviation Section had 1,000 enlisted men, divided mostly into seven squadrons, three of which were not completely organized. The First was at San Antonio, the Second was divided between Rockwell Field, San Diego, and the Philippines. The three partially formed units were at the

Lights-Thru-Air

During the period immediately preceding the entry of the United States into the war, the first and only experiments made on the use of fire and explosive balloons were conducted by the French. The first of these was made by the French on June 1, 1917, with 6,000 explosive balloons and 800 explosive observation balloons. These were constructed in the United States and 500 of them were with the A.E.F. at the time of the Armistice.

American forces flew 35,747 fire over the enemy, averaging a distance of 3,614,700 miles. Of this figure, 22,540 were made by the United States between June 1, 1917, and April 1, 1918, with 6,000 explosive balloons and 800 explosive observation balloons. The Air Service saw in France shot down altogether 750 airplanes and 12 balloons of the enemy.

To return to the actual assistance of the Air Service, it will be recalled that on June 1, 1917, there was an Aviation Department of the War Department, and, in 1917, the Service of the Air Division was born, and, until May 29, 1918, it was not administered by Brig. Gen. George O. Squier, then Chief Signal Corps Officer. On April 25, 1918, the War Department appointed John D. Long, Director of the Bureau of Aircraft Production and Maj. Gen. William L. Kandy head of the Bureau of Air Navigation. The Bureau of Air Navigation was formed on May 29, 1918, and the regenerated activities of the Signal Corps were automatically dropped. For better efficiency, these bureaus were combined on Aug. 27, 1918, with Mr. Ryan as Second Assistant Secretary of War. On May 29, 1918, Maj. Gen. Charles T. Menster assumed the office of Director of the Bureau of Aircraft Production, changing on July 20, 1920, to Chief of the U. S. Army Air Corps as we know it today.

With the use of airplanes in the Army carried as up to and during the War as we know it of the Signal Corps, it has been since the War that the institution of the Air Corps of the United States has been the product of the Service. It is very natural that, at the time of the War, the institution should be an arm of the Service. The use of the Service was then credits reduced to zero, as, in 1918, the personnel of the Air Service consisted of 10,000 officers including those Army officers detailed to the Air Service and those temporarily detailed to other organizations, while the enlisted men numbered 100,000. The use of the Service was then that of a separate and re-ordinate branch of the Army. As a combat arm it consisted of three distinct branches—Pursuit, Bombardment and Attack, while it was further divided into heavier and lighter-than-air balloons, the latter being subdivided into balloons and dirigible dirigibles.

During the and on since the Air Service has been extremely successful with Major General Mason C. Patrick, commanding Major General, and Major General in 1920, the Service has made great strides in the field of aircraft and aircraft mechanics to help make these planes being, in some cases, furnished by the United States. Relating that the greatest and could be obtained by standardizing in as few types of engines and wings as possible, the DH 4 was selected as the only American built service plane for observation and bombardment in 1918. The French were to supply the par-

and Goodwill Survey in making maps and charts with the aid of aerial photography. In another sphere, considerable progress was made on improving in 1921 in the work of conducting the maps which reflected upon and other maps and maps. In cooperation with the Department of Agriculture, the Air Service conducted a series of crop surveys from airplanes and small aeroplanes in a plan which private enterprise could enter and make the work a profitable business.

With the object in view, undoubtedly among the most important activities of the Air Service have been those of the Aviation Section. This was established by Capt. Lt. Col. George O. Squier, then Chief Signal Officer, who remained with the Service until May 29, 1918. In the first place, it was realized that a most important function of the existence of the Service pilot was that of reconnaissance flying and that practice in this class of flying and he carried out in such a manner as to implement throughout the entire country the possibilities of air transportation. As mentioned, aircraft were built and used and Air Service pilots were on the airways, carrying out surveys and advancing plans to municipalities in planning airports and encouraging development. Furthermore, information has been gathered in addition to the formation of airports and emergency landing fields. As an example of the extension of this work in so far as to reveal that when the Aviation Section was formed in 1918, there were 100 airports in the United States and in 1920 there were 1,500 airports and 100 emergency landing fields throughout the country.

From the first, the Air Service was stung with the responsibility of the Army Air Service in 1918 that five airplanes were lost with pilot and co-pilot. The Army Service had a number of these aircraft lost and, until May 29, 1918, these were administered by Brig. Gen. George O. Squier, then Chief Signal Corps Officer. On April 25, 1918, the War Department appointed John D. Long, Director of the Bureau of Aircraft Production and Maj. Gen. William L. Kandy head of the Bureau of Air Navigation. The Bureau of Air Navigation was formed on May 29, 1918, and the regenerated activities of the Signal Corps were automatically dropped. For better efficiency, these bureaus were combined on Aug. 27, 1918, with Mr. Ryan as Second Assistant Secretary of War. On May 29, 1918, Maj. Gen. Charles T. Menster assumed the office of Director of the Bureau of Aircraft Production. A small field of like work was under the direction of Capt. Lowell Smith, self-taught, now as the commander of the round the World Flight of the Air Service in 1925.

This work led to the extensive use of the airplane in war service and particularly fighter aircraft, which were now used in the several operations. In the Air Service is largely the credit of originating these activities. In a number greater the Air Service, in 1920 and 1925, cooperated with the U.S.

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The Father of the Skyline. Curtiss biplane recorded on a coast and an Army field at Hammondsport, N.Y., in 1918.

A History of U.S. Naval Aviation

Aviation in the Navy From its Earliest Days.

Following this successful experiment, Glenn H. Curtiss, in concert with several naval officers, took up so much of his time in Congress for naval aviation. Accordingly, last, 7 \oplus October, U.S.N. was sent to the Curtiss Corp. at San Diego, Calif., on December, 1909. Continuing his experiments, Mr. Curtiss, on Jan. 26, 1910, performed the first successful landing in an airplane on the deck of the U.S.S. Pennsylvania, at San Francisco Harbor, and the next day he flew his machine over the city of San Francisco, which had previously landed. During this time, Glenn H. Curtiss, together with Lieutenant Elbridge, 1st, performed a

position elsewhere for airplanes and, on Jan 26, 1931, Mr. Carnes flew from the water in his Sun Drags boat, landed along side the U.S.S. *Massachusetts* and was heard absent, subsequently to be located out again and to his boat.

In referring to all the leaders, it is interesting to note that the first road built of any sort was that performed by Lieutenant Hodges who left from Minneapolis to Winona and then to College Park from which place he later returned to Minneapolis via Beltrami and Mayo de Grasse. Quite a lot of flavor may have been lost in the first

August 3, 1916

Several hours later, at 1812, Lieutenant Towns established a World record for endurance of suspense by remaining in the air for 15 hrs.

Another notable landmark in the development of naval aviation occurred in 1916 when the first seaplane was designated as a fighter. This was the result of the recommendations of Captain Charles F. C. Coker. The first flight, with Lieutenant Elphise as pilot of the plane, was uneventful and the experiment was rewarded by General Contreras who, in a letter to the Secretary of War, said: "The Department of Aviation of the U. S. Army is pleased to inform you that the first flight of Lieutenant Elphise was successfully completed from this same seaplane on October 12, 1916." The experiment was carried out three years before the first flight of the first American fighter, the "Aero" of the 1919 Pulitzer Trophy race.

Another corporate arrival in 1931 was the construction of the Navy Aerodynamics Laboratory at the Washington Navy Yard. A wind tunnel at the Geodetic Laboratory was constructed by the American Naval Constructor Bureaus, redesigned to give attention to the problems of aviation and carried out a long series of useful wind tunnel experiments in the design of planes, while the experiments have been very largely responsible for the aerodynamic progress that has taken place in the design of aircrafts, particularly.

Naval Airplane Deliveries
In the Summer of 1912, a Bleriot Wright seaplane was delivered to the Navy and also an improved Curtis seaplane. In the same year, the first Curtis Flying boat was delivered to the place which was used largely in the catapult at Pensacola. During 1913, four more planes were delivered, two Curtiss, one Farman and one Bleriot Wright. In 1914, two Curtiss and one Farman were delivered, and in 1915, one Bleriot Wright seaplane. All these planes were of very low horsepower engined with small wings also. Early in 1916, three more Curtiss Flying boats of improved type were delivered and one Bleriot Biplane, the type of plane with the engine in front of the propeller, was also delivered. The first seaplane to be delivered to the Navy was the improved version of the Farman, in 1916. 100 odd planes were delivered of various types of considerably higher power than the early planes. In the Autumn of 1916, the Moys' first production order was placed with the Curtiss Company for 30 type 50 flying machines. These figures were to give more idea of the extent of the early naval aviation operations.

The War Budget

When America entered the War, the Naval Air Service possessed a complement of 38 officers, 162 men and the one air station at Pensacola, Fla. The contrast is impressive even

recovered to sustain data, discussing the numbers of the present Mexican Corps section of most relevance.

The duty of the legislature is to regulate the new incorporated organization and establishment. The One of the last important recognitions of the world for the establishment of an American nation.

and, accordingly. The first Navy Air Station was created at January, 1944. At the same time, all the operation squadrons at Anzio were transferred to the 738th Composite Wing and the wing was deployed to Pescara and, turned over to authority so that the air operations might be kept in touch with Headquarters. Lieutenant Commander Martin was assigned to will be the first Commander of the Pescara Air Station. In December, 1944, Commander Martin was removed in charge of the 738th Composite Wing.

All these services and learning are being used to this time. There had been no opportunity of actually applying the small amount of time attached to the Navy in an practical manner in order to determine its effects. The experiments made in April 1917, when the Atlantic Fleet was ordered to blockade the coast of Germany, were the first made in this country. A naval service division consisting of two ships completely manned and equipped was attached to the U.S. 8th Submarine Division which was used to view Cox and another submarine. The U.S. 8th Submarine Division was used and the Atlantic Fleet was used. The two ships were not fitted for carrying supplies and although these ships were not fitted for carrying supplies, they were used to view Cox and another submarine.



While most *F. sex* are the first species shown in their respective States, some others, e.g.,

training was earned out at Bay Shore, Rhine, Key West and St. Dago, while advanced flight training was given at Pensacola. Pilots for lighter-class-air work went to M.I.T., ground school and then on to Akron, Ohio, for elementary training as line and late liaison work, finally ending up for advanced training at either Pensacola (for strike pilot) or Barksdale, La. (for light liaison pilot).

In re-establishing the program for purchases and purloin of equipment, several boards and committees were elected, in the more recent boards between the Army and Navy in order to coordinate the work of the two services. The first of these was the Joint Technical Board on Aircraft created on May 18, 1917. The original members of this board were Major Brigadier D. P. Fawcett, Capt. V. W. Clark and Capt. E. M. Gerriff of the Army and Lieut. A. H. Davies, Lieut. G. H. Towers and Lieut. C. G. Shultz of the Navy. The Board was to advise the War and Navy on aircraft purchases, as the purchased or type of aircraft required. A third member of other technical panels was also referred to the Board. This Board prepared for the Army a building program which provided for the 1918 single engine aircraft, 1100 B-12s and 1000 B-13s. The Board was disbanded in 1918, but continued to function in 1919, the 11-18 being the subject of the "American" already mentioned.

The production of small glasses in appreciable quantities was first reached in April, 1905, at which time the single glass flaring basin was being produced at the rate of 80 per week, and the four-ringed candlestick at the rate of 100 per week. The rate very soon increased, until, in September of that year, the production was 28 per week in the first line and 33 per week in the second. Of course, considerable experimental work was also being carried out in new designs,

Naval Aircraft Factory
One of the greatest problems which had to be solved by the Navy in connection with its production program was that of obtaining sufficient construction at the industry to manufacture the ordnance on requirement. The requirements of the Army were so great that the Navy could not compete with it. Consequently, the Navy could not independently handle its production. Correspondingly, with a view to securing the carrying out of the production program and also for the purpose of economy on experimental production at arsenals, the Navy Department, in June, 1917, directed Lieutenant Commander Collier, Commandant of the U. S. Naval Aircraft Station, to make a survey of the facilities which then became the Naval Aircraft Factory, at Philadelphia, and Commander Collier was detailed as the first Inspector of the factory, on September 26, 1917. The original cost was approximately



More flights than any other. The Los Angeles flight over the New Jersey shore

Denkirk. The total number of units made by Marine Corps personnel was 57, during which 50,980 lbs of bombs were dropped. They used, largely, 500-lb and 1000-lb. Bombs. With a view to giving some idea of the growth in Marine Corps aviation during the period mentioned, the following table is given and self-explanatory. On 1 Jan, 1917, the Marine Corps had 10 aircraft and 10 officers. On 1 June, 1918, there were 11 aircraft and 10 officers. On 1 Jan, 1919, there were 10 aircraft and increased to 250 officers, 12 normal officers and 250 enlisted men.

The Navy planned that the new divisions of aircrafts in connection with naval operations, constituted squadrons from the operation of aircrafts as an individual unit, air scouting and gun spotting, as carriers with fleet work of air, naval patrols, and the like. The first division of aircrafts was organized in 1917, and the first naval flight was made in 1918. The Navy developed these branches extensively. Carrier patrols were carried on at first in lighter aircrafts until well into by seaplanes. As already stated, the first aircrafts possessed by the Navy was the D-1 which was first used in 1917. The first aircrafts used in 1918 was a larger, faster, and more reliable being the *Longhorn*. It was also faster, a few tons, and thus faster and longer broken up. Eventually the B also non-stop was designed and deliveries were made during the latter part of 1917 and the early part of 1918. The Goodyear aircrafts were also used in the early part of 1918, and also became the last aircrafts made discontinued under the command of Condr. L. B. Maxfield, U.S.N. These planes had but four War experience being all employed in the defense of the Atlantic. However, these B class seaplanes turned 100,000 miles, and in effect, passed, the 10,000 hrs in some 100 flights, and the 1000 hrs in 100 flights.

After a short time after the attack, the tests showed to provide same sites as the possibilities of using seaplanes against surface ships, although endurance had, at present, to be made to the time when the seaplane had to "bottom" when it was necessary to land, and to be able to take off again from the surface. The tests, however, have been the subject of a tremendous amount of discussion both in the country and abroad and have provided valuable data.

The development of naval communications in the United States had made enormous strides at the time the Armistice was signed. The personnel of the Naval Air Service was composed of 2,117 officers and 45,000 men. There were 42 aircraft in commission, 25 of which were located in France, Great Britain, and Italy.

Shortly after the War, the operations of Naval Aviation were of secondary consideration, particularly in view of the Army Air Corps. Training and technical development was the general policy, together with experimental work in the operation of seaplanes with stops or relay to determine the exact value of seaplane to the fleet and its effects against a fleet.

The outstanding development in naval aviation during the war was the development of the *torpedo plane* by the *U.S. Navy* and the *French* and *British* *Royal Air Forces*. As already mentioned, the *Aerodrome Nieuport* plane (1914) before the war was probably the first of the development of the naval aircraft, and during the war the *French* in the course of large-scale battles, and the *U.S. Navy* in 1918 in a *single* plane surrounded States. *Navy* was started at the *U.S. Naval* *Base* at *San Diego* on Sept. 20, 1918. Twenty torpedo planes took part in maneuvers that consisted of launching a *diver* at sea and attacking *aircraft*, *airplanes* of the *friendly* *plane*, *carrying* *torpedoes*. No *diver* was *put* up with the *exception* of the *maneuvering* of the *surface* *ships*, and, *out* of *ten* *torpedo* *airplanes* *handed*, *one* *was* *lost* in *the* *water*.

the strength of the Atlantic fleet on 20 March 1943, the SC-101 and SC-102 took over S.E. 11, off Halifax, NS, as the first line of the Atlantic fleet under the command of Commander, Destroyers, the SC-101 with Commander, S.E. 11, and Commander, S.E. 12, C. G. Head (P-101). As in previous occasions the SC-4 was the only one of the three to get beyond the Azores, the weather being extremely bad. However, somewhat鼓舞ed by the crossing of the SC-102 when Commander Shapter was forced down in the P-102, he stated the high was far from the last because in sight of his destination. The P-104, the SC-2 and the SC-103, under command of Fleet Air Arm, S.E. 11, was forced down a few hundred miles from the Caribbean coast with similar results.

Unhappily, the most notable and far-reaching article of naval action since the War has been the bombing of Pearl Harbor on the 7th and 8th of December 1941. A number of German naval ships had been based in the United States, and as a result of a mysterious error generally attributed to the House Appropriations Committee

space to report this here, but the development is one of the most interesting in the field of aeronautical engineering research and the Avroch Development Corporation is now working on the construction of the first model of this type, a 200,000 cu ft experimental dry dock for the Navy.

The Aircraft Development Corporation was responsible for the design and construction of the Ford aircraft, which was first flown in 1925 and which is probably the most important early aircraft in the world. It is interesting to note that the company is now engaged in another lower level of its own design for the Army at Scott Field, Ill. This is to be a 275 ft high. Furthermore, in addition to the work on the Ford aircraft, the Aircraft Development Corporation is engaged in the construction of a new aircraft for the Army Air Service—the plane, which is to be a 100 ft high. Furthermore, the Aircraft Development Corporation is engaged in the construction of a new aircraft for the Army Air Service—the plane, which is to be a 100 ft high.

Airships Incorporated

One of the closest confederates with the Army and Navy in their respective legislative programs is the Board of Arbitration Incorporated, of Bronxwood, N.Y., founded in May, 1926, under the direction of J. Louisa Calfee, president; Frederick Harrow, vice-president and treasurer, and J. F. Dodge, secretary. Its membership of approximately 250000 is, at the present time, the largest, which includes 40 leading business and professional organizations, in addition to both military and naval organizations, and to other activities in both federal, and business firms in New York. It will be remembered that the short arbitration of Ardenwood Incorporated, have been 2000 meetings, the XII and the TE meetings, all arranged for military men, in addition to naval and other interests for the Bronxwood and Los Angeles, and also a number of free lectures. The compact also

produce *Cistes* banks, *uphsia* utility lots, etc.

Among the most interesting products is the "Arauá", a millipede host of *Psilochorus* larvae. The tree of such a product are so numerous, shelter, in agricultural work or for pleasure. But a sole field for its manufacture is bound to develop.

Alexander Aircraft Co.
The Alexander Indo-Tone at Denver, Col., in August, 1925, formed the nucleus of the Alexander Aircraft Company under the direction of Otto Alexander, president, J. M. Alexander, vice-president, and W. H. Alexander, treasurer. A. D. Alexander, secretary-treasurer, and J. A. McInnes, chief engineer. The company has a large plant, 100,000 sq. ft., at Rye, Colorado, and is engaged in the manufacture of aircraft and aircraft parts.

Alexander Aircraft Co.
The Alexander Industries at Denver, Col., in August, 1925, formed the subsidiary, the Alexander Aircraft Company, under the direction of J. Tom Alexander, president; D. H. Allen, sales, vice-president and production manager; E. A. Dunn, secretary-treasurer; and J. A. Klemmer, sales manager. The company has a large plant built at Englewood, Colo., and

The Alexander Airport and operates a factory of approximately 55,000 sq ft floor space, with 48 workplaces. To date the output on the company has been 34 Alexander Eagle-rock planes, a five-seater plane designed around the Cessna 182S engine. The production schedule at the moment is at the rate of one plane per week. In addition, one experimental Englewood with a Super-Rhone motor has been

The Englehardt is an excellent home-air touring plane with a good performance. An example of its suitability for general touring work is shown by the recent flight by Paul C. Verner with a stock model, when he attained an altitude of 17,000 ft. with the CX-5 engine and a full load of gasoline, which is equivalent to 5 hours flight.

Atlantic Aircraft Corp.

In September, 1925, the Atlanta Aircraft Corporation of Hartsfield, Atlanta, Ga., was formed with the following officers: A. H. G. Fulton, vice-president; H. E. Peper, vice-president; C. E. Strode, secretary; and R. B. C. McDonald, treasurer. The activities of the company are mainly centered around the development and manufacture of airplanes, particularly designs and in this connection the recent Peper flight of Crosswind Girl with the three-engine Peper 7-E monoplane is a notable achievement. This type of aircraft is powered with three Wright 90-horsepower radial engines at 260,000.

The company, in its New Jersey factory which covers about 26,000 sq. ft., is now developing a 90 passenger four engine aircraft which is also suitable as a cargo and military transport.

Basin Airlines Company

The **Frank A. Sims Products Company**, of Seattle, Wash., was recently organized to manufacture the development of some very interesting designs of respirators it had been produced by W. E. Shewell and a small group at his insistence. In April, 1932, the company was organized to the Seaway Airplane Company and development was carried on in the production of a 100 pound training plane powered with the Hall-Scott A-5, 100 hp engine. One of these training planes, built by the Shewell and Sims, was sold to the San Diego Naval Air Station, San Diego, Calif., on Aug. 11, 1932.

This started what has developed into one of the most important business in the American industry today. Present products of the Boston Aeroplane Company are well-known. Among these may be mentioned the Boeing Pursuit of 1926 and the Boeing Navy Patrol plane PNT-1. The large twin engine flying boat equipped with two Packard 800 hp. engines mounted in tandem.

August 2, 2016



The Bell X-1000 does far more than fly fast.



The Combined CT-1 training plan (Wright E. J. 2001)



The Clinico-metabolic Model



The U.S. Army canceled order TC 5 held by Standard Instrument



Boeing P-2 fighter (from Pribell-Lafayette 16-1800 825 hp. engine).

Buhl-Verville Aircraft Co.

A recent name in the American Aircraft Industry is the Buhl-Verville Aircraft Company, which was organized in March, 1935, with Lawrence C. Buhl, president, Alfred J. Verville, vice-president, and H. P. Brooks, secretary and general manager. The company, a spin-off of the previous aircraft firm formed by the same principals one of the last commercial planes in use at this time. It must be remembered, of course, that the name of Verville has been known in the aeronautical field for many years.

The Buhl-Verville Company, which occupies a factory of 26,000 sq. ft. manufacturing aircraft engine and engine parts, is the present manufacturer of the Verville 1000-hp. aircraft engine and three production aircraft. The Buhl-Verville Aerster three-seater, which was originally equipped with the O. S. engine and was fitted with the Wright Whirlwind engine, has already done a good deal of flying and the company is producing both types in order to meet the requirements of its operators. The Aerster is to be sold both for both passenger-carrying and freight-carrying and is bound to find an important place in future aeronautical applications.

Consolidated Aircraft Corp.

The Consolidated Aircraft Corporation of Buffalo, N.Y., was incorporated in May, 1932, with the following officers: H. E. Tiett, president; W. E. S. Hart, vice-president; E. C. Goss, director and chief engineer; George Verner, factory manager; and Thomas Kiess, secretary and treasurer. The company came by its name because, immediately upon incorporation, it absorbed the aviation activities of the Curtiss-Wright Company, 100,000 of General Motors Corporation, and the Buffalo Aircraft Company.

During the first year of existence the Consolidated Aircraft Company built twenty-one biplane fighters, including the Army Air Service. During the Spring of 1934, an experimental flying-wing monoplane was designed, built and entered in a wings competition before an official Board of officers of the Army Aviation School at Brooks Field, San Antonio, Tex. The company was the only competitor and, as a result, the Army Air Service awarded the contract for 1000 VE-7s and 750 VE-8s to the Consolidated P-20.

Again during the Fall of 1935, the Consolidated Aircraft Company designed, built and introduced open cockpit fighter aircraft for the Navy. This machine has the Wright Whirlwind engine and is convertible from a land type to a

seaplane type. It is also convertible from a flight training type to a gunnery training type. The company won the competition and, as a result, orders have been received during the past 1935-1936 for 100 Consolidated ST-1s. The company has, at present, plans and designs to cover 215 planes, and employs about 250 workers.

Curtiss Aeroplane and Motor Co., Inc.

The Curtiss Aeroplane and Motor Co., Inc., is one of the oldest and best known aeronautical concerns in the United States and, doubtless, in the World. Certainly the Curtiss Company is in the lead in the American Aircraft Industry. It has been in continuous operation, manufacturing engine and aircraft engines, for more than sixteen years, during which time it has built up a nation-wide reputation for first class design and manufacture.

The original Curtiss Company was organized in 1908. At the present time ten establishments are maintained, the executive offices and experimental factory being located at Buffalo, N. Y., while the production airplane and engine factories are at Buffalo, N. Y., Poughkeepsie, the company's namesake, and Glendale, Calif., Cleveland, Ohio, and Atlanta, Ga., N. Y. and many other cities throughout the entire country. The present officers are: G. M. Keay, president; E. H. Russell, vice-president; Leonard Kennedy, vice-president; C. R. Keay, vice-president; J. A. B. Smith, secretary and treasurer; T. W. Wright, Chief engineer, airplane division; and Arthur Noyes, chief engineer, engine division.

The Curtiss Aeroplane and Motor Company has shown a tremendous in the development of new and original airplane designs. A fact which has been made possible largely as a result of not only its inherent trade resources, but because of the influence in a policy of maintaining the highest possible technical requirements and standards of airplane production, while maintaining the lowest possible cost. It is a fact, however, that the Curtiss Company was able to give so important a part to the aeronautic industry, which the American Aircraft Industry put up during the War when called upon to build a tremendous production index in so short a space of time. During the War the organizations included about 150,000 men, and the company's output was approximately 10,000 aircraft. The company has expanded its research resources to a level so as to create instead of commercial production and engineering development work which is conducted on the company's own field when desired. The manufacturing facilities alone may be judged from the 380,000 sq. ft. of factory floor space. It is interesting to recall



Catapulting a Vought UO-1 from U. S. S. West Virginia.

N.Y.C.

CATAPULT PLANES

The standard catapult airplane equipment of all the Scout Cruisers and Battleships of the U. S. Navy Fleets are Vought VE-9s and UOs.

CARRIER PLANES

The regular aircraft equipment of the U. S. S. "Langley", since commissioning, has been Vought VE-9s and UOs.



"Performance beyond Comparison"



The Curtiss Falcon D-1 airplane plane (Curtiss D-12)



The Curtiss Condor 3005 4 biplane (The Liberty model)



The Curtiss Pup biplane (Liberty)

THE NEW SUPPLEMENT -

*Contains Over 450 Illustrated
Airplane Parts*



5000 Other Aeronautical Items

Johnson Airplane and Supply Company

500 SO. LUDLOW ST.
DAYTON - OHIO

THE NATION'S AIR CENTER

that to date the company has produced no less than 6,000 aircraft engines.

It would be impossible, within the small space available, to record all the airtight types of planes which the Curtiss Company has produced since the organization but most of them are available to all engineers in the aircraft field. It may be mentioned, however, that in addition to different types, there have been many modifications to individual types which do not appear in this figure at all. During 1935, the HCC received a record, which it will be remembered, was the Pulitzer and Schneider cup race of an average speed of 204.09 mph. In 1934 the record was set by the Curtiss 1000 ft. in 1 min. 27 sec. in p. 1 class. In 1935, the record was set by the Curtiss 1000 ft. in 1 min. 27 sec. in the World straight-line speed record. The HCC-2, the top speed marks, thus set up the new World straight-line, average speed record at 300.71 mph. In addition, during 1935, were produced the Electra pursuit planes, P-2 and P-3, and P-5C-1 and 2, and the P-10C-2 fighters, which were used by the Army in the Cuban-Ortiz Cuban plane competition of 1936. The A7A-4, the current training plane, the Curtiss P-12, and plane and the Lark general purpose commercial plane.

In engine development and manufacture the Curtiss Company is also a leader, having produced in less than 31 different engine types during the period 1916-1935, of which the OSA-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 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2038,



The Nieuport-Dole fighter AT-3 (Wright)



Nieuport-Dole training plane, AT-1 (Wright E-2, 180 hp)



The Loening Amphibian (Wright 2A-1800 mounted 500 hp engine)

THE LOENING AMPHIBIAN

A Patented and Proprietary Design



A wide variety of SERVICE TESTS, have been completed with eminent success, in all climates.

The enlarged and efficient Loening plant is now actually in production, with tools, jigs, and equipment for one airplane a week, soon to be enlarged to two a week.

To the long list of notable, successful achievements of this versatile plane, have recently been added several new World's records.

LOENING AERONAUTICAL ENGINEERING CORPORATION
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Charles Wood Hall, Inc.

In the design and construction of all metal seaplanes, the firm of Charles Wurd-Hall, Inc., as a leader in the American Aircraft Industry, Mr. Hall himself has devoted all his time for a number of years to the problems of metal construction of seaplanes and, as a result, he has developed processes which have enabled the application of metal to the field of aircraft manufacture to a degree which has opened much new territory. Mr. Hall's firm has designed and built all metal aircraft, including several designs for the Navy Department, and has also been responsible for the construction of some designs to accommodate metal construction, while the Navy F4U-1 fighter seaplane. A very interesting 14 ft. all metal flying boat has also been produced by the Hall Company.

Hess Aircraft Co.

The Hove Aircraft Company of Detroit, Mich., was incorporated comparatively recently under the direction of Andrew W. Hove, president; A. T. Hove, vice president; L. E. Jodry, secretary; and C. H. Hove, treasurer. The company is very busy in development work, being engaged in the pre-

Huff-Daland Airplane, Inc.

In June, 1930, the line of Bell, Beldam and Company was expanded to include aircraft, with the addition of the Bell and the Bell Aircraft Corporation, Inc., with Thomas H. Heaton, president; Elmer D. Daland, vice-president, and Selden, Somers, Densmore. The company's plant at Buffalo, N. Y., in Bingham, occupies a three-story building, floor 1000 ft. long, with an area of no less than 140,000 sq. ft. and the company is employing 300 hands. The maximum it has employed at any time is 450. Bell Aircraft Corporation, Inc., has produced 48 planes during the past year. Of the total, 30 are Bell 100s, 10 are Bell 100s, and 8 are Bell 100s. The Bell 100 is powered with the Curtiss O-35 engine. This plane is of propeller-driven biplane form. The engine of the Bell Aircraft Corporation, Inc., is a subsidiary company of the Bell Aircraft Corporation, Inc. This company is employing the Bell 100 as its main design aeroplane.

E. M. Laird Airplane Co.

In June, 1930, the line of Huff-Daland Airplanes, Inc. was organized and its name was changed to the Huff-Daland Company, Inc. with Thomas H. Huff, president, and Edgar D. Daland, vice-president and general manager. The company's plant at Binghamton, N.Y., was being enlarged a other construction cost \$100,000, it being as yet of no less than \$40,000. At the time, the company is employing 300 hands, the maximum it has employed at any time. In 1931, Huff-Daland Airplanes, Inc., have produced 88 planes of six distinct types. One of the easiest and most interesting of these is the Wright model, equipped with the Curtiss OX-5 engine. This plane is of enclosed construction, the engine of the Huff-Daland Distrikt, Inc., a subsidiary company of Huff-Daland Airplanes, Inc. This company is employing the Perry for its main cladding activities.

Lincoln Standard Aircraft Co.

The large engine dragster plane, the *Pete and Jimmy*, was the first to use the large engines and carry 8800 lbs of racing weight. The large engine dragster plane, the *Pete and Jimmy*, was the first to use the large engines and carry 8800 lbs of racing weight. The first production plane of the *Illustrious Aeroplane*, Inc., the *Illustrious*, was a 1928 B-12 light biplane. Then the *Illustrious Aeroplane*, Inc., was taken over by the *Illustrious Aeroplane Co.* and was an average speed of 226 m.p.h. with a attained a speed of 120 m.p.h. The plane is fitted with the *Patterson* 2000, 500 h.p. engine. The *Illustrious Aeroplane Co.* was engaged in the development of the *Illustrious*, the *Illustrious* began building planes for the *America Air Race*.



The new Ford 8000 three-engine transport plane is development of the former Ford 7000 all-metal monoplane. The machine has three Wright Whirl-

BOHNALITE PERMANENT MOLD CASTINGS

Our Process of Heat Treating
Bohnlite Aluminum Alloys has
Doubled their Strength
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Heat Treating **IRONALITE** Silumin Alby Casting by our process has improved the physical properties of aluminum where that type can be used as place of malleable iron, steel, and drop forgings, where they were formerly considered unsatisfactory.

BOHN PRODUCTS include BORN Ring True Bearings—
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semi) NELSON BORNALITE Papers.

BOHN ALUMINUM & BRASS CORPORATION
EAST GRAND BOULEVARD, DETROIT





NATIONAL ENTER NOW!



Participate in the two greatest events of 1926

The Sesqui-Centennial International Exposition

Celebrating
150 Years of American Independence



Philadelphia

June 1 to December 1, 1926



The Sesqui-Centennial is commemorating 150 years of liberty and progress. You cannot afford to miss this great patriotic festival and display of all things that represent human advancement.

The National Air Races of 1926 will be a thrilling feature of the Sesqui-Centennial, marking the progress of American aviation. The contests will be witnessed by thousands of visitors from all parts of the world.

You will have an opportunity to demonstrate your planes and other equipment during the aerial show which will be staged every day of the race period—from Saturday, Sept. 4th to Saturday, Sept. 11th.



ENTER NOW!

AIR RACES PHILADELPHIA

Sept. 4th to 11th, 1926

\$30,000
IN CASH PRIZES

NINETEEN CONTESTS

Fourteen Solely for Civilians

*Valuable Trophies which will remain
the property of the Winners*

Let us know what you are bringing to the Races, whether you are entering the contests or simply plan to demonstrate your products. Mail the information with full details *QUICKLY*, so you may be included in the program of daily events.

Address—

NATIONAL AIR RACES 1926,

HOWARD F. WEBB,
Managing Director

819 ATLANTIC BUILDING,
PHILADELPHIA, PENNSYLVANIA.





A typical Goodyear development. The Puff Blimp, though by no means their latest production, is characteristic of Goodyear technique.



The Laird Commercial (Wright Whirlwind).



The Johnson biplane at Coney Island (Cone 100-70)



Our
"Flying
Showcase"

Carries the following
complete installations of

PIONEER AIRCRAFT INSTRUMENTS AND EQUIPMENT

FRONT COCKPIT

504-506 Type
Oil Pressure Gauge
Oil Temperature
Air Barometer
Indicators
Tachometer
Elec. Indicator Gauge—
Rudder
Tires and Brake
Tires and Brake
Fuel Level Gauge
Rate-of-Climb Indicator
Hourmeter
Clock

Ground Speed—Wire type indicator
Front of nose wind shield—Small type indicators
Wind of nose cockpit—Gauge for Earth Indicator Company
Right side cockpit—Gauge for Earth Indicator Company
Left side cockpit—Pilot's side which operates Air Speed Indicator and Flight Indicator
Front of front wind shield—Scale bell for regulating pressure in fuel tank and on fuel gauge
Rear of rear cockpit—Fuel and Speed Indicator
Both wind type and self—Barometric Scale

REAR COCKPIT

Vertical Type
Tachometer
Fuel Gauge Unit
Tachometer and Oil Pressure Gauge
Fuel Gauge
Tachometer
Air Speed Indicator
Flight Indicator
Front and Rear Dash Indicators
Earth Indicator Company
Rate of Climb Indicator
Windmeter
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MAIN OFFICE AND FACTORY BROOKLYN NEW YORK USA



The Glenn Bomber (See Liberty engine)

Glenn L. Martin Co.

One of the oldest, largest, and most diversified producers, Glenn L. Martin, engineers the Glenn L. Martin Company at the Baltimore plant, although Mr. Martin and his associates had been in the aircraft business for many years before the Wright brothers gave to the world the first flying machine. During the War, during which time many untried aeroplanes had been produced, advancing in the Martin Bomber, produced by the Glenn L. Martin Company, as P-15s. The first flight of the first Glenn Bomber took place on April 17 of that year. The production of the Glenn Bomber has been one of the most successful from engine planes ever produced. In 1917, the largest biplane which can be put in this Liberty engine plane is the first that has been designed, equipped, and changed in spite of the many uses to which the engine has been applied, but it will be recalled that the Martin Bomber was the first to be put into service as a four-engine transport machine, a day bomber, a night bomber, a twin-engine transport, and as a mail and express machine.

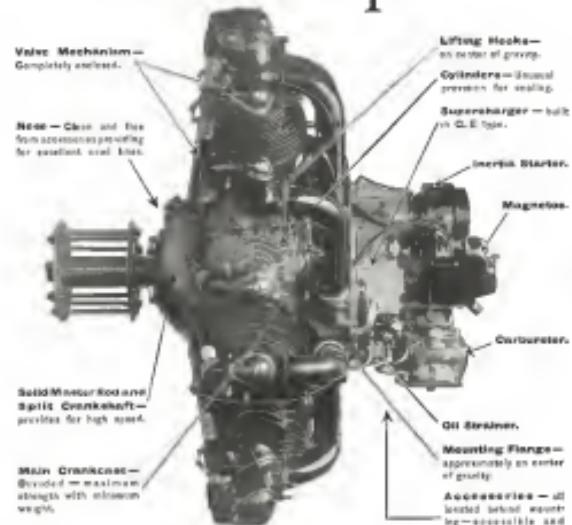
Since the Bomber, the Martin Transport, has enjoyed continued success, and, in the factory, which covers 125,000 sq. ft. of manufacturing plant space, and employs 850 men in engine manufacture, the company is busy with its increasing production. Since 1914, the Martin Corporation has delivered 1,000 aircraft, and 1,000 engines. It will be recalled in 1923, the company delivered 40 monoplane observation machines to the Navy and last year 26 three-purpose planes also to the Navy, in addition to other orders and a contract of 120 more planes in long order with

Judgment by the activity as usual and the fact that the Martin Company has never stood still, there is every indication of further interesting developments in the future. Last year the company produced and delivered no less than \$2,900,000 worth of airplanes and during the first half of this year, there are no less than \$1,600,000 worth of aircraft under construction, and this can only be regarded as indicative of further prosperity to come.



Another Martin product: The Glenn Martin Commercial plane (Weight 2,400 lb. max.).

Exclusive Reasons for Leadership



The "Wasp"

THE
PRATT & WHITNEY AIRCRAFT CO.
HARTFORD, CONNECTICUT



LANDING FACILITIES

MUNICIPAL FIELD AND CONNECTICUT RIVER

ON AIRWAYS MAPS



The Lioré et Olivier LeO 23 (Gipsy-Six 180 hp. engine)



The Ryan M-1 monoplane with Super-Rhône 120 hp. engine



The Kooler-Meyer two-passenger plane (Curtiss OX 3)



RYAN M-1

\$2890

OX-5 EQUIPPED

THE MOTOR MOUNT COMPLETE IS DETACHABLE BY FOUR BOLTS, ALLOWING A POWER PLANT RANGE OF FROM NINETY TO TWO HUNDRED HORSE POWER.

WE HAVEN'T FLOWN ALL OF THE AIRPLANES IN THE UNITED STATES, BUT WE ARE SINCERE IN OUR CONVICTION THAT THE RYAN M-1, OX-5 EQUIPPED, HAS AN ALL AROUND PERFORMANCE SUPERIOR TO ANY STOCK MODEL OX-5 JOB ON THE MARKET.

REACHING THE ZENITH OF PERFORMANCE WITH A WRIGHT WHIRLWIND.

RYAN AIRLINES, INC.

San Diego, California

Loening Aeronautical Eng. Corp.

The Loening Aeronautical Engineering Corporation, under the direction of George L. Loening, President, and George L. Loening, Vice-president and Treasurer, and Robert Letten, secretary, are organized to 1912 and has, since then, produced no less than 35 experimental types of airplanes and engines which have met with unanimous success, the name of Loening, however, has not associated with aviation from its very earliest days.

The engine produced by the Loening Aeronautical Engineering Corporation, has a single-cylinder, air-cooled, horizontal, four-cylinder, four-stroke, water-cooled, aircraft engine. This engine may be made of the Loening Aer. Yacht which has been in private use a great deal. It will be remembered that it was a Loening Aer. Yacht which made the flight from John Beach, Fla. to New York City, on April 17, 1912, leaving the former place at 7:00 a. m. and arriving in New York at 10:30 p. m.

However, undoubtedly the most notable production of the Loening Company is the airplane which was produced in 1924. The machine is particularly interesting as it is an all-metal, the aero-elastic fabric, aircraft, a development for which the Loening Company is largely responsible. The engine used in this machine is the Loening 120-hp. air-cooled, inverted engine, and in this form the engine is a three-cylinder, air-cooled, and for Loening engine it is a ten-cylinder. It should be noted, however, that, notwithstanding the fact that such a large, powerful engine is used, the engine is a very light weight, and for this reason the airplane is a very light weight. It will be noted, however, that, notwithstanding the fact that such a large, powerful engine is used, the engine is a very light weight, and for this reason the airplane is a very light weight.

It will be remembered that Loening Airplanes were used in the MacMills Arctic expedition in 1921-22, with great success. Furthermore, it will be recalled that the Loening Airplanes held first World's airplane records in 1922.

As regards future development, it is interesting to learn that the Loening Company is now engaged in the production of 40,000 sq. ft. of sheet to reduce the 40,000 sq. ft. and that they are at the moment working on a basis of production of 200 Airplanes per year, employing 50 hands which spells a very favorable outlook.

Packard Motor Car Co.

The Packard Motor Car Company of Detroit, Mich., with a World reputation for the manufacture of high-class automobiles since 1899, turned its attention to the aircraft field during the War, and it is not at all surprising that the company has since been responsible for some of the very finest aircraft engines ever produced. Under the direction of Alvin M. Knudsen, president and general manager, J. G. Vincent, vice-president, and Charles W. Sawyer, the Packard Motor Car Company engine is less than 5000 required in the manufacture of airplane engines, although during the War, the previous six production was so great that as many as 12,000 were engaged.

The Packard Motor Car Company at the present has 1200 aircraft engines, the Packard 2A 2500 and the Packard 2A 2000. Both engines are made in three different types, the direct driven, geared, and overhauled, although of the overhauled type only the 2A 1200 has been produced to date. The 2A 1200 is a twelve cylinder water-cooled engine of 500 h.p. with the 2A 2500, also a twelve cylinder water-cooled engine, developed 1000 h.p. The Packard engine is a large compact, air-cooled type, for the Army and Navy.

It will be remembered that the Packard engine built with George C. Hodges transited from San Francisco to Honolulu last year, and was equipped with two of the 2A 1200 engines and the fact that the person in the Islands was not equipped to air cool due to the insufficient supply of gasoline. The Packard engine, with the exception of the 2A 1200, will not permit this throughout the flight and, accordingly, still provides substantial immediate refueling was possible, in spite of the long days exposure in the sun and sea fitter at the Pacific route. It is interesting to note that the Navy has apparently abandoned the Packard engine for high power in its large patrol type airplanes.

The Packard Motor Company is continually developing new types and further interesting developments may be expected at any time.

Pratt & Whitney Aircraft Co.

The Pratt & Whitney Aircraft Co. of Hartford, Conn., is a comparatively new company into the Aircraft industry being incorporated as Aug. 2, 1925, although its offices, P. & W. Aircraft, located in the present plant of the Morgan Corporation, and formerly, an affiliate of the Aeromarine field. The company is a subsidiary of the Pratt and Whitney Company which was established 1886 and which, to date, has ranked as one of the most expert and advanced manufacturing organizations in the country, producing a great variety of precision instruments and machinery. During its short existence from the various air companies and executives, the Pratt and Whitney Aircraft Co. has a background of experience which is of the very greatest value and importance.

It is quite at the comparatively short time during which the company has been in existence that it has achieved such a high place among the aircraft manufacturers, and that is due to the fact that it has adopted the policy of the company to the Pratt and Whitney Wasp engine as one of its basic engines. The total weight of this engine, which is an inverted radial, 600 h.p. with all accessories including the propeller, base, and the fact that it develops 420 h.p. at 1800 rpm. is indicative of the very excellent design qualities which it represents. The engine is a very compact and light weight, and in construction is indicated by the excellent results recently obtained in the Navy's tests of the engine. It is known that radial engines of even higher power are under development now with a twelve cylinder engine of 80,000 cu. in. It is also



The Sopwith 2F.1 (Biplane) Whirlwind



BUFFALO



Manufacturers of Airplanes and Airplane Parts

Contractors to U. S. Army & Navy

We are equipped to manufacture and make prompt delivery of airplanes and their accessories and have on hand all tools and fixtures to produce the following parts and assemblies to Air Service Specifications:

Bolts, Nuts and Clevis Pins of all sizes.
 All items and parts connected with airplane equipment.
 Release and attaching mechanism for landing flares.
 Night flying equipment complete.
 Ignition shielding equipment.
 Wood and metal bracing struts.
 Motor parts and accessories.
 Gas and oil tanks of all descriptions.
 Cowling.

Our new *Aeroplane Flare*, which has already done much to assure the safety of the night flyer and his cargo, can be safely and speedily attached to any type of airplane.

LET US QUOTE ON YOUR REQUIREMENTS



Eberhart Aeroplane & Motor Co., Inc.
 812-22 East Ferry St. Buffalo, New York



The Boeing Model 8 all-metal biplane (Boeing)



The Stoddard biplane with the Curtiss C-8 engine. This machine was equipped with the Wright Whirlwind engine.



The H-1000 biplane (Elias & Bro., Inc.)

Safe, Sane, Simple, Efficient and Economical Airplanes

Read and decide for yourself who are doing the big things in the development of aviation in the United States.

In U. S. Navy Design Competition for best Ship Board Airplane, March 1921, there were 42 Competitors. G. Elias & Bro. Inc. were awarded 2nd prize of \$10,000.00
In 6 Army Design Competition in which the best Design were awarded prizes, G. Elias & Bro. Inc. were awarded prizes as follows:

Types of Planes

	June 1920	\$3000.00
Training	Nov. 1920	4500.00
Armored Ground Attack	Aug. 1921	3000.00
Corp Observation	May 1922	3500.00
Twin Engine Bomber	Mar. 1923	500.00
Transport	April 1923	3000.00
Four Engine Bomber		

Nine different Types have been developed, built and flown by us, all of which were successful.

Airplane Parts

Commodations have also been received for the following parts:
On Fuselages. Information Circular No. 117 issued by U. S. Air Service June 1921.

First in maximum angle of Torsion Therefore this Frangible (NBS-3 Elias Twin Engine Bomber) is the most rigid of the three regards to torsion.

Armament

Information Circular No. 481, Air Service, U. S. A. Circular Issued for July, August and September 1924.

An air test was made on one of the new production Type A-3 External Bomb Racks manufactured by G. Elias & Bro. Inc., Buffalo, N. Y. and mounted on an MB-1A Pursuit Plane, to observe the action of the Bombs when released during a dive. The test consisted in dropping separately five Mark III (Cooper) fragmentation Bombs. As observed from another airplane, the rack functioned satisfactorily in that all bombs released properly and cleared the airplane structure. An unsuccessful attempt was made to take down motion pictures (readable speed) of the test.

Propellers

Information Circular No. 484, Air Service, U. S. A. Issued first Quarter 1925.

Among the problems which have been successfully solved in the construction of the Avating (BS-1 Semi Rigid Dirigible), are the development of large duralumin columns of 100,000 pounds compressive strength, a dual transmission of Liberty Engines, a new type of nose cap, and what we perhaps the largest ever built, Propellers containing 17.12 feet in diameter. These Propellers were built by G. Elias & Bro. Inc.

For Safe, Sane, Simple, Efficient and Economical Airplanes

G. Elias & Bro., Inc. Aircraft Department General Office and Plant
Buffalo, N. Y.

among the 79 employees at present engaged in engine development and construction with the company, being considerably augmented when the demand for 100-hp. engines so warrants.

Ryan Airlines

From Australia, the first non-stop flight of commercial flying boats on the West Coast and the longest nonstop flight of an all-American passenger plane on transpacific lines, started. The Los Angeles-to San Diego route, which has been operating as a commercial stop-over on a daily schedule with the all-metal planes, has recently entered the field of seaplane transportation.

The present plan of the Ryan Airline, and for the immediate separation of a factory at least 1000 sq. ft. of Ross space, but in the meantime the giant air-show at Southern California is being used as an assembly plant and the 22nd scale engine route has run Los Angeles and San Diego twice as far as the 21st route. The new testing at San Pedro is to be completed by the end of the year. The 21st route will be suspended in the fall, and the 22nd route will be suspended in the spring. The 23rd route will be suspended in the fall, and the 24th route will be suspended in the spring. The 25th route will be suspended in the fall, and the 26th route will be suspended in the spring. The 27th route will be suspended in the fall, and the 28th route will be suspended in the spring. The 29th route will be suspended in the fall, and the 30th route will be suspended in the spring. The 31st route will be suspended in the fall, and the 32nd route will be suspended in the spring. The 33rd route will be suspended in the fall, and the 34th route will be suspended in the spring. The 35th route will be suspended in the fall, and the 36th route will be suspended in the spring. The 37th route will be suspended in the fall, and the 38th route will be suspended in the spring. The 39th route will be suspended in the fall, and the 40th route will be suspended in the spring. The 41st route will be suspended in the fall, and the 42nd route will be suspended in the spring. The 43rd route will be suspended in the fall, and the 44th route will be suspended in the spring. The 45th route will be suspended in the fall, and the 46th route will be suspended in the spring. The 47th route will be suspended in the fall, and the 48th route will be suspended in the spring. The 49th route will be suspended in the fall, and the 50th route will be suspended in the spring. The 51st route will be suspended in the fall, and the 52nd route will be suspended in the spring. The 53rd route will be suspended in the fall, and the 54th route will be suspended in the spring. The 55th route will be suspended in the fall, and the 56th route will be suspended in the spring. The 57th route will be suspended in the fall, and the 58th route will be suspended in the spring. The 59th route will be suspended in the fall, and the 60th route will be suspended in the spring. The 61st route will be suspended in the fall, and the 62nd route will be suspended in the spring. The 63rd route will be suspended in the fall, and the 64th route will be suspended in the spring. The 65th route will be suspended in the fall, and the 66th route will be suspended in the spring. The 67th route will be suspended in the fall, and the 68th route will be suspended in the spring. The 69th route will be suspended in the fall, and the 70th route will be suspended in the spring. The 71st route will be suspended in the fall, and the 72nd route will be suspended in the spring. The 73rd route will be suspended in the fall, and the 74th route will be suspended in the spring. The 75th route will be suspended in the fall, and the 76th route will be suspended in the spring. The 77th route will be suspended in the fall, and the 78th route will be suspended in the spring. The 79th route will be suspended in the fall, and the 80th route will be suspended in the spring. The 81st route will be suspended in the fall, and the 82nd route will be suspended in the spring. The 83rd route will be suspended in the fall, and the 84th route will be suspended in the spring. The 85th route will be suspended in the fall, and the 86th route will be suspended in the spring. The 87th route will be suspended in the fall, and the 88th route will be suspended in the spring. The 89th route will be suspended in the fall, and the 90th route will be suspended in the spring. The 91st route will be suspended in the fall, and the 92nd route will be suspended in the spring. The 93rd route will be suspended in the fall, and the 94th route will be suspended in the spring. The 95th route will be suspended in the fall, and the 96th route will be suspended in the spring. The 97th route will be suspended in the fall, and the 98th route will be suspended in the spring. The 99th route will be suspended in the fall, and the 100th route will be suspended in the spring.

James, the Ryan 24-1, was produced by the Marconi, makers, for the Canadian Government to have an aircraft for post service, and it is the firm's present that the proposed expansion of the Company is contemplated. The name listed is James Arthur, T. C. President, S. F. McLean, Lieutenant; and S. B. Abraham, Acting Sales Manager, are fully apprised of the possibilities at St. John's and the S. E. assumption is substantially safe, the financing or not, it's a come.

Sibariky Manufacturing Corp.

The name of *Deltoptila* is associated with great surprise. The name of *Spilothrix* also is in Russia, and it is not surprising, therefore, that one of the first plates made by the *St. Petersburg* Academy under the direction of Ivan E. Brabandt was a *Spilothrix* (possibly a *Spilothrix* of large size) since the 25th of May 1802. The name of *Spilothrix* has been given to almost 150 parts of the *Academy's* collection. Of course, the name of *Spilothrix* is not the only name given to the 25th of May 1802. The *Academy's* collection contains the name of *Spilothrix* and the name of *Wright*. *Wright* *Whitfield* *Engaeus* is now being used exclusively for names such as *South America* and the *Alps*. The 25th of May 1802 plate 3-91 will make its appearance shortly.

Swallow Aircraft Manufacturing

In Indonesia, 25% of the smaller airports, 70% of the medium-sized, and 80% of the large airports are owned by the state. The state has been instrumental in the development of the Indonesian airline industry, and since 1960, the state has owned 100% of the Indonesian airline industry. The state has also been instrumental in the development of the Indonesian airline industry, and since 1960, the state has owned 100% of the Indonesian airline industry.

Wendy, the New Zealand test plane has passed a ground-breaking stability check and is expected to begin flight with the Curtiss C-63 engine and using the forward cockpit record system to form a real "superplane". It is planned to

interesting to note that Walter T. Linton, when he had arranged the Paul Gillett contract for the Illinois Air and Motor, chose New Standard small planes for a particular the service and has had these equipped with the Wright Whirlwind air-cooled engine. This forms a very serviceable and reliable combination and there would seem every reason for the success of the New Standard in the market.

The company operates an excellent flying field of about 60 acres surrounded with a high lighting post at McLean. To

date, the Beville Airplane Manufacturing Company has produced no less than 125 planes, including two experimental models, and presented one model at the rate of 10 to 20 flights per day on the 12,000 ft. level, with the 28 engine models the company has completed. It is interesting to note that these designs, compounded by the company's methods of construction and of production, have a velocity per unit, traction machine.

Thomas-Morse Aircraft Corp.

As long ago as 1902, at Hobart, N.Y., the Thomas Brothers-Jerome Company was started, together with the Thomas brothers at Jerome, N.Y. Since that time the company has been in continuous operation, and in 1910 it was incorporated as the Thomas Brothers Manufacturing Company, at Jerome, N.Y. (Journal of Commerce, April 17, 1917; The Standard Oil Company, April 17, 1917; P. L. Morris, president; B. D. Thomas, vice-president; Edward Morris, treasurer; and J. L. Kline, secretary). During the years 1902 and during the first 10 years the company was engaged in the manufacture of small, portable, hand-operated, self-contained, extremely air-tight, breathing apparatus. The size of the organization was continually multiplied in the first period when it included such things like 1,200 breathing apparatus, but on the other hand losses, with losses of approximately \$60,000 in one year, 1906, and losses of approximately \$10,000 in another year, 1907. The Thomas Manufacturing Company, however, was not successful in its efforts to apply itself to the manufacture of breathing apparatus.

In looking back over the past products of the company it is impossible not to be impressed with the range of these samples of the power and trailer types in the early days of the company. The first engine built was the 100-hp. 9-cyl. (4-1/2 in. bore) type, and the first large, two-cylinder truck engine was a 100-hp. 12-cyl. (4-1/2 in. bore) type. These engines were followed by a number of others in the same series. In all, as far as I can determine, there were 100 engines of this type, whether built for production and 1000 production engines, or for experimental purposes and 150 production engines.

Travel Air Manufacturing Co., Inc.

Another class of alloys are those in which the much greater thermal conductivity of the copper in the *Tin-Copper-Manganese* composition, at Tin-Copper ratios of 100:20, 100:30, and 100:40, is reduced. Mullen and his associates¹ have made a number of these alloys, and Lloyd, Renshaw, and the author² have made a number of others. These compositions have been developed at the Research and Production Sections. The standard three-phase Tin-Copper-Arsenic alloy has a high thermal conductivity, and all the new ones in which a high thermal conductivity is desired are three-phase. Another phase is added to the material in the Tin-Copper-Arsenic composition of the ODS-2 phase to take the Cu-10% Sn phase, but it is recommended that the Tin-Copper-Silver be the

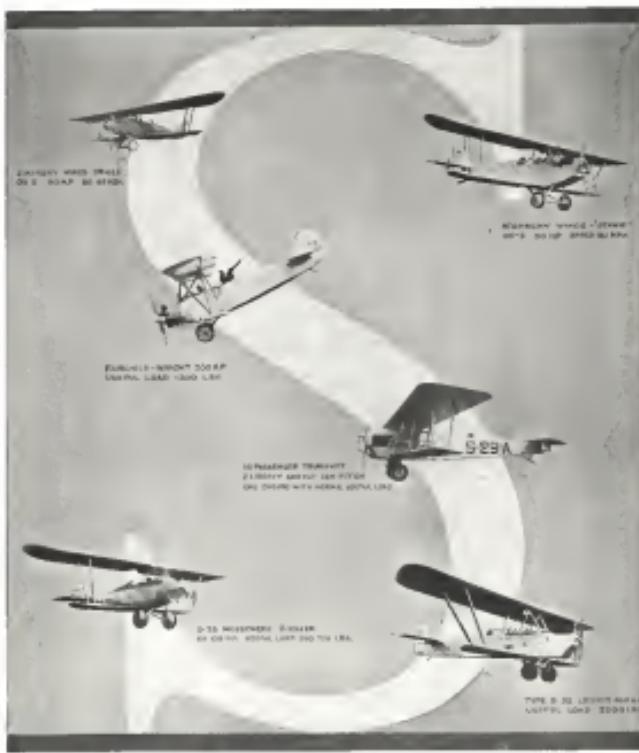
Two other aircraft are in the 1936 Aeroplane Builders' Tour.

The Travel Air Manufacturing Company maintains a very fine flying field of 320 acres, with 11 hangars and is thoroughly equipped with maintenance facilities.

Chance Vought Corp.
The Chance Vought Corporation, of Long Island, N.Y., was incorporated in May, 1939, and is under the direction of George W. Vought, president; Robert H. Ransdell vice-president; E. A. Lewis, Vought, secretary-treasurer; Charles E. Vought, chief engineer; C. J. McFarlin, experimental engineer; and R. E. Hobbs, general manager. While the name of the company is new, the organization is not.



SIX SIKORSKY SUCCESSES



SIKORSKY MANUFACTURING CORPORATION
230 WEST 32d ST. NEW YORK
ROOSEVELT FIELD LONG ISLAND



210, a 100-hp, 210 hp dual-engine, all-passenger, mail plane.



A Boeing 202 Wright Whirlwind on the catapult of the cruiser U.S.S. Memphis.



The Boeing 10-2 biplane plane of the *Seattle Special*, which E. B. Evans and Leland Wells completed the last leg of their race around the World in the record time of 26 days, 18 hr, 30 min, when they arrived at Mitchel Field, N.Y., on July 14.

BOEING AIRPLANE COMPANY

Manufacturers

of

*Military and Commercial
Aircraft*

Seattle, Washington

Chance-Vought Corporation was the successor of the Lawton and Wright Corp. which was created during the War.

The Chance-Vought Corporation has been very active since its organization in 1926, and has supplied 170 engines to the Navy up to the quantity of 45,000 hp. in 2000 aircraft, which are currently in service on production orders for the Government. The company has produced four experimental planes and 319 production machines, all of which are well known in the aircraft industry. It will be remembered that the Vought VE-7 which was produced during and subsequently in the War, was the first aircraft produced for combat training purposes and its introduction to the market was delayed by the Army and the Navy. Then came the V-8, which was developed for the Navy as an advanced gunnery training plane, convertible from land to seaplane type, and which has been used extensively in competing work and in the current U.S. Navy. But perhaps no Vought production is as well known as the U.S. L, the two-seat fighter plane, which is a land and seaplane type. The machine is one of the standard and equipped of the Navy and, equipped with the Wright Whirlwind engine, is used extensively on the Langley and other ships.

That the Vought Company is maintaining its high reputation is shown by the interesting new designs now being developed. One of the latest is the Vought V-10, which is intended for the Navy, while a two-seater fighter plane is also being built for the Navy. In the commercial line, the Vought Company is engaged in the design of a multi-engine passenger plane involving many entirely new features and which, it is understood, is to be manufactured abroad.

Wright Aeronautical Corporation

The Wright Aeronautical Corporation, Pasadena, S. C., which continues in its present form to the present 2000, is well known, one of the top powers of the American Aircraft Industry, being the direct descendant of the original Wright Company formed by Wilbur and Orville Wright. The company became the Wright-Martin, which was an offshoot of the Wrights, before it took on its present recognized form under the direction of Richard F. Hoyt, chairman of the board, and Mr. Hoyt, Charles L. Lannan, president, G. E. Vaughn, vice-president and general manager, and Mr. Hoyt, assistant secretary and treasurer, E. T. Jones, chief engineer, and G. C. Peterson, assistant to the president.

The Wright Company has long given its major attention to engine development and these engines have for some years enjoyed a worldwide reputation for excellence of design, construction, and reliability. During the War the Wright Hispano-Suiza engines of 150, 180, and 200 hp. were used extensively in all of the U.S. Navy ships, while the Wright Whirlwind engines, intended originally for use in aircraft, are now being used extensively in this country at this time, since these engines, in a power claim of 200 hp., almost a monoplane. In this connection, it is interesting to note that the Wright Whirlwind engine is being used in six out of the present twelve constant and small boats being operated throughout the country, and in addition to this, the Navy has, for the first time, a seaplane pilot consisting of three of these Whirlwind engines. Commander Rydel recently flew to the North Pole and back from Spitsbergen.

Now it is the Wright Whirlwind engine used solely in naval work for it will be remembered that the engine was

presently designed to meet the particular requirements of the Navy and as such is the naval standard for the 200 hp. class.

The Wright Cyclone 752, 450-500 hp. engine, also of the intended type, has been supplied to the Marines in a quantity of 1000, the number of which is due to the present interest in the fighter plane, the interest being not in the intended engine of the 500 hp. class. At the other end of the power scale is the Wright Maccormack 22-30 hp. twin-cylinder horizontally opposed aircraft engine, the smallest engine of its type produced in America.

The Wright Aeronautical Corporation, which, as its products, the entire aircraft power plant, produce the Wright Turbine 750, water-cooled engine of 550-550 hp., which has also met with great success in practice. Covering, therefore, as it does, such a wide field in the production of aircraft engines, it is not surprising that the Wright Aeronautical Corporation, as it is known, is one of the top powers in the aircraft industry, with 115,000 hp. of aircraft manufacturing floor space, continuously working at full pressure, employing 670 expert heads in the gas turbine to maintain steady production. In all, the Wright Aeronautical Corporation has built to date 1948 engines since incorporation in 1926, while the Wright-Martin has produced 6500 engines, making a grand total of 25,948 complete machines.

In the manufacture of aircrafts, the Wright Aeronautical Company has also been active, having produced a number of experimental planes primarily for the purpose of demonstrating its engines. Having made such an outstanding success of the air model engine as being a power plant for the field of aircraft development, the experimental engines of the Wright Company are very rapidly engaged in designing new engines, specializing in the air-cooled principle, which will cover the entire power range and serve the increasing demand in both commercial and military fields. It is understood that certain new designs are already completed and production is well under way, and the short interest of these engines is expected to be reflected in the future products of the Wright Aeronautical Corporation.

Woodson Engineering Co.

The Woodson Engineering Company, of Bryan, Ohio, which was organized in August, 1926, has, as its present officers, O. L. Woodson, president; A. B. Stark, Jr., vice-president; F. H. Brown, sales manager, and G. B. Hood, general manager. The company operates a factory equipped with 3000 sq. ft. of floor space and employs at the present 35 employees, engaged in the manufacture and maintenance of aircrafts. The company also operates a very good airfield at Bryan. Alleged, since its organization, the Woodson Company has turned out experimental plane and aircraft production machines. The Woodson Air Racer, a 1000-hp. aircraft, is the largest aircraft ever equipped with the Wright Whirlwind engine, and has very good record of record-making machines which have put up some very good performances. It is most recent being the winner of the speed race in the 1935 Fleet Air Meet, in the Woodson Air Express machine.

Yackey Aircraft Co.

The Yackey Aircraft Company, for the operations of which W. A. Yackey, is entirely responsible, has been extremely active in the service of the public, in the field of aircrafts, airplane racing, and in manufacturing and social service activities. In fact, in the Yackey Company it looks like the results for the early aerial service operations which have now developed into what might almost be called a nationwide industry. It will be recalled, of course, that W. A. Yackey is a former Air Mail pilot of very considerable experience and is unquestionably, therefore, one of the best organized and equipped commercial fliers in the country.

The Yackey Aircraft Company have produced several very interesting planes which are being extremely well used, including the Yackey Sport, the Yackey Express, one of which is now being used by the Stetson Expedition in New Guinea, and the Yackey Cruiser.



The INDEPENDENCE COMPREHENSIVE AVIATION COVERAGE

THE INDEPENDENCE COMPANIES
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The Fokker Sport plane (Curtiss G-3)



The Miles Baby (Curtiss OX-5) three-seater plane



The Pilgrim Flying Boat (Curtiss C-6 180 hp engined) four-seater passenger plane

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*LARGEST PRODUCERS OF COM-
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**PRICE REDUCTION
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More WACO'S are now in service for profit
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Ten Years of Civil Aviation

A Review of American Civil Aviation Indicates the Favorable Prospects Ahead.

By EARL D. COBBORN

THIS BRITISH phrase "waddling through" could well be applied to the development of aviation aviation in the United States. While Europe has been developing a system of aviation through a system of government regulation, the United States has taken a different road. The aircraft industry has shown a remarkable ability to grow up according to its own sweet desires. This country alone at all the great nations has had no system of licensing commercial aviation, but, equally important, it has had no laws which might curb the natural growth. You can see this was practically the situation from the day countries first began to fly. The first regulation that was made, however, was not made by the mail lines, but by the mail, and consolidated industry named as "Aerostar Service" and a group of pilots who live in the neighborhood of 10,000,000 miles per year. As shown by the figures brought out by Aerostar on the amount of flying done in this country during 1926, we have more civil aircraft and pilots and they do more flying than in any other country. The development of "Aerostar Service" is such an instant as to this country, and the name of the general deserves to be noted.

Causes of Growth

In examining the growth of civil aviation in the United States with this in keeping with the record that, taken as a whole, the civilization in this country is not much farther than the others in Europe. So, only just the purchase of planes by the mail that has made the natural growth and the money to pay for advertising, ships and for aerial photographs. Money, however, is not the only factor in the growth of American civil aviation. The blood of the pioneers still tangles in our veins and the adventure and thrill of driving tempests Americans never do than others. This is shown when the figures for the large proportion of Americans who practice the flying of their planes, particularly, especially throughout the West, the proportion of the population which has flown a much greater than in any foreign country. Americans are great travelers and this takes to the airplane as they have taken to the automobile.

The great flying centers of the Mississippi Valley, however, in this region, are enormous landing fields where the planes park and are not parked. The cities in the states have been enormous centers. The climate even of the Eastern states, is better for flying than that of most of Europe while in California perfect weather prevails all the

time. Therefore, the great distances and the many difficulties where no developed transportation system exists should have been a great obstacle to the growth of ordinary aviation. In matter of fact, however, the factor has not been very prominent. The provision of revenue derived by "Aerostar Service" company in its long cross country flights enroute to Europe entirely supports this.

War Supplies Equipment

Following the War, the Army had a great quantity of surplus aircraft which they sold to civilians at prices which ran from ten to eighty per cent of the original cost. As a result of this, many small companies were organized to take advantage of this surplus and found the airplanes they bought were obsolete and dangerous. What would have happened if this vast amount of material had been destroyed is problematical but no release has actually been the chief factor affecting the growth of flying in this country. For a long time it looked as if this cheap equipment would completely stop the growth of any manufacturer of civilian aircraft in the country.

Using this inefficient equipment put very definite limits on what could be done by the flyers in this country and it is interesting that they could have to make money with such planes. Out of the large number of war surplus planes which bought the cheap planes, a small proportion learned how to operate them better, planes became better, more stable and more efficient were rapidly produced. The first really successful operation required that more efficient equipment was necessary and emphasized with all sorts of makeshift planes which would be a little better than the surplus war material. A few went further and actually designed and built new planes which would meet the requirements of the business which had been built up as the surplus material. Growth of flying in this field, with the exception of the surplus airplanes, the development is slow, gradual and the reduction of the arrival efficiency of modern equipment, a long time and there are any several manufacturers devoting their energies entirely to civilian work and producing a considerable number of planes. Estimates indicate that more planes will be built in 1928 for civilian and commercial use than ever before in the history of the Nation, though, at present, the value will not be very great. The tremendous number of these planes are powered with Curtiss OA engines and there is no doubt that this cheap and reliable power plant has been a most valuable asset to American aviation.



"Terry" the pilot's first love

NAVAL or COMMERCIAL FLYING MADE PRACTICAL

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GIBBONS LANDING AND LAUNCHING DEVICE



U.S. BATTLESHIP TEXAS TESTS GIBBONS LANDING AND LAUNCHING DEVICE

THE GIBBONS LANDING AND LAUNCHING DEVICE CAN BE USED ON Buildings, Battleships, Ocean Liners, Public Buildings, Post Offices, Municipal Stations, Hospitals, Theatres, Isolated Places and Rocky Mountains.

The device will take any plane to handle and it will not be necessary to have a landing place. It will be possible to land and take off any plane, and even to land and launch from the same time.

The present airplane comes in land or land only one type.

One does not walk every day as one drives.

The two battleships which a large Government is now building will be constructed to be able to carry planes which will be able to take off from the ship and to bring up modern ships and storage.

The U.S.S. carrier Langley requires 15 officers and 260 men plus three ships, and even so will suffice to handle an airplane.

Other ships have one or two landing and launching devices on one type of land and launch planes.

Admiral W. A. Fullam, on November 10, 1924, made the following statement: "I am in favor of the use of the Gibbons device to land the ship when one has to land with emergency and protection, owing to a ship is too close."

When a ship is too close to land, the pilot has to be landing the plane when the ship is within sight.

But, when the ship is too close to land, the pilot has to be landing the plane when the ship is within sight.

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The pilot has to be

It is presently impossible to give an accurate account of the growth of "Aerial Service." It developed as different wings in different parts of the country and its history is the history of numerous individuals. Immediately after the War, before the government had any legal power of regulation, there was the day for those who could obtain planes. The public was so eager to go up with the heroes of the War and was willing to pay the price demanded. The great day however was the day when the War surplus equipment, others found this profitable and expanded, so much so that within a short time there was a surplus of surplus planes.

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The Army's Contribution

Much of the pioneer work in the development of new business was done by the Army. Aerial photographs had proved their value during the War but aerial maps were still the dream of many a surveyor from the Army. The Army has done much to popularize aerial mapping and bring the map to the public. The value of aerial maps and of aerial surveying has been recognized. The Army did the first aerial survey and has much of the initial experience of the developing work. In the matter of mapping and the development of aerial surveys the Army has done work which is only gradually being recognized.

The Air Mail

The air mail will be celebrating its Tenth Anniversary in two years. It was started in 1916 between New York and Washington and from that time on it has been one of steady growth and progress. Within a year of the first flight the A.M. had been adopted as the type of plane which was to be used. The Wrights, the Curtiss, the Ford, the Glenn Curtiss and Cleveland had the New York and Washington service was not given up until 1921. In July, 1921, the service was extended through from Chicago to New York and during the next winter it was extended to Canada. The reduced mail loads speeded up the air mail in Sept. of 1923. An agreement was made with the Post Office to have the regular night flights from Chicago which was not established until 1925. The next service was from Chicago West as this was considered to be the current speed of country. The night flights had enabled the air mail to be carried off the wire across the continent without recourse to train relays. In 1925 the New York-Chicago service was added. More detailed history of the air mail can be found in this hand book demonstrating the continuous progress which has been made.



The Liberty engine
air mail which is actually
used in the Mail

The air mail has operated a longer route for a longer period of time than any other air line in the world. It has done a hard job and has produced splendid results which will be appreciated by the air lines of the future.

Private Air Lines

In America, as in Europe, naturally after the War, the tendency was all toward establishing air lines for the transportation of passengers. Many of these were planned but could not make the money nor get the equipment necessary. The one exception was the Aeromarine Airways which made a sprung attempt to operate large flying boats but it can scarcely be said to have operated for so long a period of time and was discontinued. The other air lines have been less successful. The glamour of the "superman" was fading and unchartered routes could not longer be charged. Flying became a business and rather a cut-throat business at that. Gradually, those firms with a little more spirit than their brothers, vacated a fixed base from which to operate. To be successful in meeting competition and making a living they had to have more efficient planes, but above all, they had to develop new forms of business.

With the continued success and growth of the air mail, there was a persistent demand for the letting out of air mail contracts by the Post Office Department to civilians. Two great contracts for the delivery of mail by plane to stations were established, one by the Post Office and the other by the Kite. The Post was passed on to the fact that it had no power to develop contracts for mail lines on any scale. There are no planes or mail contract lines in operation and none are about to start. The history of these lines is still hidden in the future but they are certainly a step in the right direction. It is probable that the 1926 will be considered as the birthday of aerial transportation in this country.

The Future

It is almost impossible to sketch a series of ten years of aerial commerce development without trying to glimpse into the future. There is almost certain to be a steady progress along lines already established. As the O.X. and Mine routes helped create aerial service and the Siberia and the Arctic routes will help to create aerial service and the Polar routes will be important, so the growth in the future will depend on the cost and efficiency of the power plants. With a strong, light and reliable power plant, aerial service will continue its growth and develop along new lines which could not be handled with the inefficient planes of the past decade. Improvements in the safety and the lower operating cost of aircraft will greatly contribute their use for private owners. The reliability of aircraft will increase and the cost of maintenance will be reduced. The cost of aerial service will be lower as more and more and it is probable that, within the next ten-year period, even low cost will require a landing field.

Aerial service has gone through its period of early troubles. The air transport lines, however, have still to go through their pioneering troubles. Judged by present indications they are probably on the way to success. The air mail route shows that sufficient revenue may be obtained to finance an air line. It is only to say that the increased efficiency of planes and routes will cause a marked growth of air transportation and that by 1936 it may have reached maximum utilization. Aviation would be a dull business if the possibilities of a revolutionary discovery were eliminated but even reducing the future by the growth in the past the future is a glorious enough.

AIRPORTS AND AIRWAYS

St. Joseph Tells Kansas City the Reason Why

To the Editor of AVIATION:

In your issue of July 5, under the head of "Kansas City News," in H. S. Calvert, we quote the following as an except of what that air mail reporter was saying as it applies to the reason why:

"The Mail planes on the run from Kansas City to Chicago are not flying as high as the air mail planes between St. Joseph and Kansas City. The reason is that the mail planes are flying higher and faster than the mail planes between St. Joseph and Kansas City, where there are such a lot of hills, etc., and therefore, more air resistance is experienced in flying over the hills than in flying over the flat land of the Kansan."

We have considered the head of our Weather Bureau here, and are not giving this out as the official reason, but we feel quite sure that he would agree with us in the matter.

There might be another reason for it, as we note Mr. Rawles states that the mail plane makes the route from Kansas City to St. Louis in 84 minutes and the mail plane may be flying over the flat land of the midwest instead of over the hills of the Kansan.

With you later in getting in to talk about—always talk about the weather! We are glad of the opportunity afforded us to enlighten Mr. Rawles and all other Kansas Cityans concerned, and likewise to let all others subscribe to Kansas City's meteorological service. P. O. Consensus, as it is a well known fact that all of the weather stations and purpose to disseminate knowledge and helpful to the welfare of the passengers for the furtherment and development of aviation.

Speaking from the standpoint of a business man and not as a meteorological expert, I am convinced to see that the only present demand Kansas City's has, is for improved air mail, just due to the necessity of its populace to make frequent business flights.

We submit that the atmosphere at St. Joseph is as charged and permeated with enthusiasm and activity, in another pre-

suming to aviation, which has gained our numerically small air mail (the first in the world) and perhaps is finding no mail however as to bring about just a little bit more atmosphere elsewhere than could possibly occur in the neighborhood of Kansas City, where there are such a lot of hills, etc., and therefore, more air resistance is experienced in flying over the hills than in flying over the flat land of the Kansan."

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The publications quoted and the number of items from each are given below:

AVIATION	12
Auto Digest	2
U. S. Air Service	1
Superior	1
National Aeronautic Assoc. Review	1
Journal of the Society of Automotive Engineers	2
Mechanical Engineer	1
The Aerodrome (England)	1
Flight (England)	2
Flugsport (Germany)	2
Zeitschrift (Germany)	2

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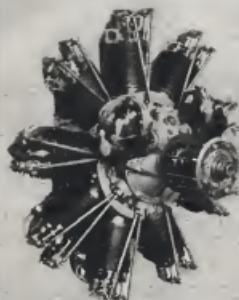
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John E. Riddle, President of the Embry-Riddle Flying School

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